

FILE COPY

Office-Supreme Court, U.S.

FILED

FEB 11 1961

JAMES L. BROWNING, Clerk

No. 454

In the Supreme Court of the United States

OCTOBER TERM, 1960

UNITED STATES OF AMERICA AND ATOMIC ENERGY
COMMISSION, PETITIONERS

v.

INTERNATIONAL UNION OF ELECTRICAL, RADIO AND
MACHINE WORKERS, AFL-CIO, ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF
APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

BRIEF FOR THE PETITIONERS

ARCHIBALD COX,

Solicitor General,

WILLIAM H. ORRICK, JR.,

Assistant Attorney General,

DANIEL M. FRIEDMAN,

Assistant to the Solicitor General,

MORTON HOLLANDER,

Attorney,

Department of Justice, Washington 25 D.C.

IRVING D. NAIDEN,

General Counsel,

COURTIS OULAHAN,

Deputy General Counsel,

ARNOLD KESTENBAUM,

Attorney,

Atomic Energy Commission, Washington 25, D.C.

INDEX

Opinion below.....	1
Jurisdiction.....	2
Questions presented.....	2
Statute and regulations involved.....	3
Statement.....	3
1. Atomic reactors.....	3
2. The PRDC power reactor.....	11
3. Proceedings before the Commission.....	19
4. The decision of the Court of Appeals.....	22
Summary of argument.....	22
Argument.....	33
I. The Atomic Energy Commission satisfied the requirements of the Atomic Energy Act of 1954 and of its own regulations in granting the PRDC construction permit.....	33
A. The statutory provisions.....	35
1. The licensing system.....	36
2. Protection of the public health and safety.....	37
B. The Commission's regulations and procedures.....	42
C. The Act authorizes Regulation 50.35 and the practice of granting provisional construction permits upon finding reasonable assurance that a reactor of the general type proposed can be built and operated safely.....	49
1. Regulation 50.35 conforms to the two-step procedure authorized by Section 185 of the Act.....	49
2. Regulation 50.35 is a valid exercise of the rule-making power.....	52

II

Argument—Continued

I. The Atomic Energy Commission, etc.—Continued

C. The Act authorizes, etc.—Continued

3. The legislative history of the 1954 Act supports Regulation 50.35 and confirms the view that definitive safety findings are not required for the issuance of a construction permit..... Page 55

4. The acquiescence of Congress confirms Regulation 50.35 and the Commission's practice thereunder..... 62

D. The Commission's findings comply with the regulations and are supported by substantial evidence..... 66

II. The Commission is not required to make an express finding showing "compelling reasons" before approving the location of a reactor near a populated area..... 75

Conclusion..... 90

Appendix A..... 91

Appendix B..... 137

CITATIONS

Cases:

American Radiator and Standard Sanitary Corp.,
CPRR-50, 25. Fed. Reg. 1968..... 46

Ashbacker Radio Co. v. Federal Communications Commission, 326 United States 327..... 56

Brooks v. Dewar, 313 U.S. 354..... 66

Chapman v. Shreveport, 225 La. 859, 74 So. 2d 142, appeal dismissed, 348 U.S. 892..... 54

City of Piqua, Ohio, A.E.C. Docket No. PP-2..... 84

De Aryan v. Butler, 119 Cal. App. 2d 674, 260 P. 2d 98, certiorari denied, 347 U.S. 1012..... 54

Federal Housing Administration v. The Darlington, Inc., 358 U.S. 84..... 55

Federal Security Administrator v. Quaker Oats Co., 318 U.S. 218..... 54

Federal Trade Commission v. Algoma Lumber Co., 291 U.S. 67..... 81

III

Cases—Continued

	Page
<i>Federal Trade Commission v. Sewell</i> , 353 U.S. 969.....	81
<i>Interstate Commerce Commission v. Parker</i> , 326 U.S. 60.....	77
<i>Ivanhoe Irrigation District v. McCracken</i> , 357 U.S. 275.....	65, 66
<i>Jacobson v. Massachusetts</i> , 197 U.S. 11.....	54
<i>Kraus v. Cleveland</i> , 163 Ohio St. 559, 127 N.E. 2d 609, appeal dismissed, 351 U.S. 935.....	54
<i>National Broadcasting Co. v. United States</i> , 319 U.S. 190.....	54
<i>Norwegian Nitrogen Products Co. v. United States</i> , 288 U.S. 294.....	55
<i>Pacific Gas & Electric Co.</i> , AEC Docket No. 50-133, intermediate decision of October 17, 1960.....	44
<i>Panama Canal Co. v. Grace Line, Inc.</i> , 356 U.S. 309.....	63, 66
<i>Secretary of Agriculture v. Central Roig Refining Co.</i> , 338 U.S. 604.....	81
<i>United States v. American Trucking Association</i> , 310 U.S. 534.....	55
<i>United States v. Detroit & Cleveland Navigation Co.</i> , 326 U.S. 236.....	77
<i>United States v. Storer Broadcasting Co.</i> , 351 U.S. 192.....	77
Statutes and Regulations:	
Atomic Energy Act of 1946, Section 1(a) (60 Stat 755).....	53
Atomic Energy Act of 1954, 68 Stat. 919, as amended, 42 U.S.C. 2011:	
Section 1 (42 U.S.C. 2011).....	91
Section 1(a) (42 U.S.C. 2011 (a)).....	91
Section 1(b) (42 U.S.C. 2011(b)).....	83, 91
Section 2 (42 U.S.C. 2012).....	91
Section 2(e) (42 U.S.C. 2012(e)).....	38
Section 3 (42 U.S.C. 2013).....	93
Section 3(a) (42 U.S.C. 2103(a)).....	83
Section 3(d) (42 U.S.C. 2013(d)).....	11, 23, 35, 38, 83
Section 29 (42 U.S.C. 2039).....	94
Section 31 (42 U.S.C. 2051).....	94
Section 32 (42 U.S.C. 2052).....	96
Section 33 (42 U.S.C. 2053).....	96
Section 41 (42 U.S.C. 2061).....	96
Section 42 (42 U.S.C. 2062).....	98
Section 43 (42 U.S.C. 2063).....	98
Section 44 (42 U.S.C. 2064).....	98

IV

Statutes and Regulations—Continued

Atomic Energy Act of 1954—Continued

	Page
Section 51 (42 U.S.C. 2071).....	63, 99
Section 52 (42 U.S.C. 2072).....	99
Section 53 (42 U.S.C. 2073).....	100
Section 53(e) (42 U.S.C. 2073(e)).....	40
Section 57 (42 U.S.C. 2077).....	103
Section 58 (42 U.S.C. 2078).....	63, 104
Section 61 (42 U.S.C. 2091).....	63, 104
Section 62 (42 U.S.C. 2092).....	105
Section 63 (42 U.S.C. 2093).....	105
Section 64 (42 U.S.C. 2094).....	106
Section 65 (42 U.S.C. 2095).....	107
Section 66 (42 U.S.C. 2096).....	107
Section 81 (42 U.S.C. 2111).....	40, 108
Section 101 (42 U.S.C. 2131).....	36, 109
Section 102 (42 U.S.C. 2132).....	36, 109
Section 103 (42 U.S.C. 2133).....	24, 36, 37, 38, 40, 47, 52, 53
Section 104 (42 U.S.C. 2134).....	24, 36, 37, 38, 52, 53, 76, 111
Section 104(a) (42 U.S.C. 2134(a)).....	111
Section 104(b) (42 U.S.C. 2134(b)).....	11, 38, 47, 51, 52, 111
Section 104(c) (42 U.S.C. 2134(c)).....	112
Section 104(d) (42 U.S.C. 2134(d)).....	31, 39, 52, 67, 76
Section 105 (42 U.S.C. 2135).....	112
Section 106 (42 U.S.C. 2136).....	114
Section 107 (42 U.S.C. 2137).....	114
Section 108 (42 U.S.C. 2138).....	114
Section 109 (42 U.S.C. 2139).....	115
Section 110 (42 U.S.C. 2140).....	115
Section 123(c) (42 U.S.C. 2153(c)).....	63
Section 123(d) (42 U.S.C. 2153(d)).....	63
Section 161(b) (42 U.S.C. 2201(b)).....	24, 39, 52, 116
Section 161(i) (42 U.S.C. 2201(i)).....	24, 27, 31, 40, 52, 78, 116
Section 161(p) (42 U.S.C. 2201(p)).....	116
Section 170 (42 U.S.C. 2210).....	87, 117
Section 170(i) (42 U.S.C. 2210(i)).....	63
Section 181 (42 U.S.C. 2231).....	123
Section 182 (42 U.S.C. 2232).....	26, 27, 37, 52, 59, 61, 123

Statutes and Regulations—Continued

Atomic Energy Act of 1954—Continued

Page

Section 182(a) (42 U.S.C. 2232(a)).....	20,
24, 31, 39, 51, 76, 78, 124	
Section 182(b) (42 U.S.C. 2232(b)).....	124
Section 182(c) (42 U.S.C. 2232(c))..	58, 59, 83, 87, 124
Section 182(d) (42 U.S.C. 2232(d))..	58, 59, 83, 87, 125
Section 183 (42 U.S.C. 2233).....	125
Section 184 (42 U.S.C. 2234).....	125
Section 185 (42 U.S.C. 2235).....	11, 20, 23,
26, 27, 37, 50, 51, 52, 55, 56, 57, 59, 61, 76, 126	
Section 186 (42 U.S.C. 2236).....	127
Section 187 (42 U.S.C. 2237).....	127
Section 188 (42 U.S.C. 2238).....	127-128
Section 189 (68 Stat. 955, amended, 71 Stat. 579) ..	59, 128
Section 201 (42 U.S.C. 2251).....	129
Section 202 (42 U.S.C. 2252).....	62-63, 129
Section 203 (42 U.S.C. 2253).....	130
Section 204 (42 U.S.C. 2254).....	130
Section 205 (42 U.S.C. 2255).....	130
Section 206 (42 U.S.C. 2256).....	130
Section 207 (42 U.S.C. 2257).....	130
Section 251 (42 U.S.C. 2016).....	63

Communications Act of 1934:

Section 319(c) (47 U.S.C. 319(c)).....	56
71 Stat. 576.....	58, 66
10 C.F.R. 2.102.....	132
10 C.F.R. 50.34.....	31, 42, 78, 133
10 C.F.R. 50.35. 25, 26, 29, 42-43, 48, 53, 67, 68, 69, 70, 135	
10 C.F.R. 50.40.....	42, 69, 70, 135
10 C.F.R. 140.12, as amended, 25 F.R. 2944.....	89

Miscellaneous:

Annotation, 43 A.L.R. 2d 453.....	54
100 Cong. Rec. 10079, 3 Leg. Hist. 3103.....	41
100 Cong. Rec. 10397, 3 Leg. Hist. 2848.....	59
100 Cong. Rec. 10398, 3 Leg. Hist. 2849.....	59
100 Cong. Rec. 10432-10433, 3 Leg. Hist. 3253-3254 ..	15
100 Cong. Rec. 10910, 3 Leg. Hist. 3461.....	87
100 Cong. Rec. 11157, 3 Leg. Hist. 3528.....	60
100 Cong. Rec. 11566, 3 Leg. Hist. 3759.....	57, 60
100 Cong. Rec. 11754, 3 Leg. Hist. 3877.....	60
24 F.R. 4184.....	84

Miscellaneous—Continued.

Glasstone, <i>Source Book on Atomic Energy</i> (2d. ed., 1958).....	Page 3
Green, <i>The Law of Reactor Safety</i> ; 12 Vanderbilt L. Rev. 115, 122.....	56
H.R. 9757, 83d Cong., 2d Sess., 1 Leg. Hist. 977-979, 983.....	58
Hearings on Development, Growth and State of the Atomic Energy Industry before the Joint Committee on Atomic Energy (1956), 84th Cong., 2d Sess.:.....	
p. 106.....	64
p. 133.....	64
Hearings on Governmental Indemnity before the Joint Committee on Atomic Energy, 84th Cong., 2d Sess.:.....	
pp. 60-65.....	89
pp. 62-65.....	65
pp. 211-215.....	89
Hearings on Governmental Indemnity and Reactor Safety, before the Joint Committee on Atomic Energy, 85th Cong., 1st Sess.:.....	
pp. 10-12.....	89
pp. 26-27.....	89
pp. 54-55.....	85, 89
pp. 116-121.....	89
Hearings on Development, Growth and State of the Atomic Energy Industry before the Joint Committee on Atomic Energy (1958), 85th Cong., 2d Sess.:.....	
pp. 119-121.....	65
p. 123.....	65
Hearings on Indemnity and Reactor Safety before the Joint Committee on Atomic Energy, 86th Cong., 2d Sess.:.....	
pp. 192-209.....	89
pp. 200-204.....	85
pp. 225-226.....	89
pp. 241-242.....	89
pp. 247-250.....	84

VII

Miscellaneous—Continued

Hearings on Operation of AEC Indemnity Act before
the Joint Committee on Atomic Energy, 85th
Cong., 2d Sess.:

pp. 51-53	89
pp. 56-57	65
pp. 57-58	89

Hearings on the Development, Growth and State of
the Atomic Energy Industry Before the Joint Com-
mittee on Atomic Energy, 86th Cong., 2d Sess.,
p. 579

137

Hearings on S. 3323 and H.R. 8862 before the Joint
Committee on Atomic Energy, 83rd Cong., 2d Sess.:

p. 113 (2 Leg. Hist. 1747)	56
pp. 117-118 (2 Leg. Hist. 1751-1752)	56
pp. 117-119 (2 Leg. Hist. 1751-1753)	56
p. 118 (2 Leg. Hist. 1752)	85
p. 119 (2 Leg. Hist. 1753)	56
pp. 226-227 (2 Leg. Hist. 1860-1861)	56
p. 417 (2 Leg. Hist. 2051)	56
p. 465 (2 Leg. Hist. 2099)	41
pp. 493-494 (2 Leg. Hist. 2127-2128)	15
p. 565 (2 Leg. Hist. 2203)	15
p. 568 (2 Leg. Hist. 2206)	15
p. 575 (2 Leg. Hist. 2213)	36
p. 582 (2 Leg. Hist. 2220)	86
p. 601 (2 Leg. Hist. 2239)	41
pp. 774-780 (2 Leg. Hist. 2412-2418)	87

H. Doc. 328, 83rd Cong., 2d Sess.:

p. 6 (1 Leg. Hist. 50)	36
pp. 6-7 (1 Leg. Hist. 50-51)	83, 86
p. 7 (1 Leg. Hist. 51)	41

H. Rept. 2181, 83rd Cong., 2d Sess.:

p. 3 (1 Leg. Hist. 999)	83, 86, 87
p. 9 (1 Leg. Hist. 1005)	83
p. 26 (1 Leg. Hist. 1022)	41
p. 121 (1 Leg. Hist. 1117)	58
pp. 122-123 (1 Leg. Hist. 1118-1119)	59
p. 123 (1 Leg. Hist. 1119)	60

VIII

Miscellaneous—Continued

H. Rept. 435, 85th Cong., 1st Sess.:

pp. 1-3.....	89
pp. 5-6.....	89
pp. 31-34.....	89
p. 38.....	89
pp. 39-40.....	89

Hughes, <i>On Nuclear Energy</i>	3
--	---

Joint Committee on Atomic Energy, <i>A Study of AEC Procedures and Organization in the Licensing of Reactor Facilities</i> , 85th Cong., 1st Sess. (Joint Committee Print 1957).....	66
--	----

Joint Committee on Atomic Energy, <i>Atomic Energy Legislation through 86th Congress, 1st Session</i> (Joint Committee Print 1960):	
pp. 81-141.....	63
pp. 195-205.....	63

3 Leg. Hist. x-xi.....	59
------------------------	----

Marks & Trowbridge, <i>Framework for Atomic Industry</i> , p. 76 (1955).....	56
--	----

<i>Nuclear Reactors Built, Building or Planned in the United States as of June 30, 1960</i> , TID 8206 (AEC, 2d Rev. 1960).....	11
---	----

Point LOMA Process Heat Reactor, Report of Advisory Committee on Reactor Safeguards, March 14, 1960 (AEC Public Document Room).....	84
---	----

S. 3690, 83rd Cong., 2d Sess., 1 Leg. Hist. 729-731, 735.....	58
---	----

S. Rept. 1699, 83rd Cong., 2d Sess.:

p. 3 (1 Leg. Hist. 751).....	35, 83, 86, 87
p. 9 (1 Leg. Hist. 757).....	35, 83
p. 26 (1 Leg. Hist. 774).....	41
p. 121 (1 Leg. Hist. 869).....	58
pp. 122-123 (1 Leg. Hist. 870-871).....	59
p. 123 (1 Leg. Hist. 871).....	60

S. Rept. 296, 85th Cong., 1st Sess.:

pp. 1-3.....	88
pp. 5-6.....	88
pp. 31-34.....	88

In the Supreme Court of the United States

OCTOBER TERM, 1960

No. 454

UNITED STATES OF AMERICA AND ATOMIC ENERGY
COMMISSION, PETITIONERS

v.

INTERNATIONAL UNION OF ELECTRICAL, RADIO AND
MACHINE WORKERS, AFL-CIO, ET AL.¹

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF
APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT

BRIEF FOR THE PETITIONERS

OPINION BELOW

The opinion of the Court of Appeals (R. 953-968)² is reported at 280 F. 2d 645. The opinion of the Atomic Energy Commission is set forth at R. 630-712.

¹ This case has been consolidated with *Power Reactor Development Company v. International Union of Electrical, Radio and Machine Workers, AFL-CIO, et al.*, No. 315, this Term (R. 972-973).

² Citations are to the pages of the printed record in this Court consisting of three volumes. In Volumes I and II, such pagination is given at the bottom of each page; the boldfaced references at the top of each page indicate the original pagination of the certified transcript of proceedings before the Atomic Energy Commission, utilized in the court below.

JURISDICTION

The judgment of the court of appeals was entered on June 10, 1960 (R. 969), and petitions for rehearing *en banc* were denied on July 25, 1960 (R. 970-971). The petition for a writ of certiorari was filed on September 29, 1960, and was granted on November 14, 1960 (R. 973; 364 U.S. 889). The jurisdiction of this Court rests upon 5 U.S.C. 1040 and 28 U.S.C. 1254(1).

QUESTIONS PRESENTED

1. Whether the Atomic Energy Act of 1954 requires the Atomic Energy Commission, in granting a permit for the construction of a developmental atomic power reactor, to make the same findings with respect to the safety of its operation as are required before it grants an operating license.

2. Whether the Act precludes the Commission from approving a site for an atomic power reactor that is close to a populated area—based on Commission findings that the site is suitable for a reactor of the general type and that there is reasonable assurance that its operation there would not cause undue risk to the public health and safety—unless the Commission further finds that there are “compelling reasons” for such location.³

³ A subsidiary question presented is whether, as the court of appeals held (R. 963), “the Commission’s findings regarding safety of operation are ambiguous.” See *infra*, pp. 69-70.

STATUTE AND REGULATIONS INVOLVED

The pertinent provisions of the Atomic Energy Act of 1954 and of the Commission's regulations are set forth in Appendix A, *infra*, pp. 91-136.

STATEMENT

This case involves the validity of a permit for the construction of a large developmental atomic power reactor, issued by the Atomic Energy Commission under the Atomic Energy Act of 1954. By a divided vote the court of appeals set aside the construction permit upon the ground that the Commission did not make certain findings which a majority of the court deemed prerequisite to its issuance.

1. ATOMIC REACTORS

The world's first atomic reactor—a device capable of maintaining a controlled fission chain reaction—was the historic Chicago Pile, which commenced operation at Stagg Field on December 2, 1942. Eighteen years later many different types of reactors are being used for a variety of civilian and military purposes—for power, propulsion, research and training, medical therapy, testing and the production of new atomic fuel (*i.e.*, fissionable materials). But the same basic principles—the controlled, self-sustaining nuclear chain reaction—are common to all.⁴

⁴ For a discussion of these basic principles in terms helpful to the layman, see the testimony of Professor Hans Bethe at pages 736-779 of the record; Hughes, *On Nuclear Energy*; see also Glasstone, *Source Book on Atomic Energy* (2d ed. 1958).

Nuclear Fission—When a free neutron strikes the nucleus of an atom of uranium (U) in just the right manner, the nucleus flies into fragments—that is to say, a splitting or “fission” occurs—which results in (1) fragments composed of several dozen different elements, nearly all of which are highly radioactive forms of the elements and are therefore called “radioisotopes,” (2) energy, and (3) free neutrons.

The total weight of the fragments and free neutrons remaining after fission is less than the weight of the original atom. Mass has been turned into energy according to the famous Einstein equation, $E=mc^2$; in other words, the energy resulting from fission is the amount of mass which is “destroyed,” multiplied by the square of the velocity of light. The resulting energy is chiefly the kinetic energy of flying fragments. As they bump into other matter and into each other, the kinetic energy is transformed into heat. One of the central problems in the development of power reactors for industrial use was to find safe and efficient methods of converting this heat into electricity.

Neutron Reproduction.—The fission of the nucleus of an atom releases free neutrons. If one of the neutrons released were invariably to strike the nucleus of another atom in just the right manner to cause fission, there would be a self-sustaining chain reaction lasting as long as the fissionable material. Obviously, this would also be true if one started with 100 nuclear reactions in a mass of fissionable material which released free neutrons exactly 100 of which always

struck new nuclei in just the right manner to cause fission. If the 100 reactions in the first generation produced only 95 reactions in the second and the decline continued, the chain reaction could not sustain itself. On the other hand, if the 100 reactions in the first generation produced 105 reaction-causing neutrons in the second and an additional 5 per cent compounded in each successive generation, then the chain reaction would not only be self-sustaining but the amount of energy released—the “power level”—would increase. Because the lifetime of each generation is very short, the increase at this rate of reproduction would be rapid indeed.

Fission is constantly occurring in natural uranium but the reaction is not self-sustaining because the material susceptible to fission is widely dispersed, hence too many of the neutrons released suffer fates other than striking the nucleus of another fissionable atom. Because we are dealing with very, very large numbers—literally many billions of atoms—the fate of the free neutrons is mathematically predictable; and the predictions can be verified empirically. In this sense their fate is also controllable, within certain limits, by methods presently to be described. It is chiefly by controlling the fate of the free neutrons that man can control the rate of reproduction and thereby create a self-sustaining chain reaction, alter the power level, and keep the reaction under control.

One of the fates which may befall free neutrons released by fission is passing entirely out of the fissionable material (or “fuel”) before striking another

nucleus in such a way as to cause another nuclear reaction. These neutrons become irrelevant. Since striking another nucleus in this manner is a matter of chance, the number of neutrons which suffer this fate obviously depends upon the distances they have to travel before they are free of the fuel, in other words, upon the size or volume of the fuel. Atomic scientists speak of the amount which will permit a self-sustaining chain reaction as the "critical size". If the fuel is in lumps, cores, or pins separated from each other, the rate of reproduction will be affected not only by their size and number but also by their shape and arrangement with respect to each other, by the distances between them and by reflecting material surrounding them. Thus, one method of controlling the rate of reproduction, and therefore the power level of a reactor, is to add or subtract fuel or to change its physical arrangement.

A second fate which befalls neutrons freed by fission is their capture by impurities in the fissionable materials. The impurity may be the result of accident as in the case of other elements mixed with uranium ore in its natural state. It may be a necessary part of the apparatus as a whole, even though it reduces its reactivity. It may be a foreign substance introduced into the fuel for the very purpose of capturing free neutrons, thereby reducing the rate of reproduction and lowering the power level. Thus, inserting and withdrawing control rods made of a non-fissionable neutron-absorbing material such as boron is the principal method of controlling a chain reaction.

Still another way of influencing the fate of the neutrons freed by fission is to control their speed. All the neutrons emitted by fission are moving exceedingly fast—8,000 miles per second—but the chance that any single neutron will strike and split the nucleus of another atom is increased, and therefore the rate of reproduction is increased, by retarding the neutrons without capturing them. The substances which serve this purpose are called “moderators.” The most useful moderators are made of elements with low atomic weights such as hydrogen and carbon. For example, the moderator in the atomic pile at Stagg Field was a highly refined graphite.

Fissionable Materials for Atomic Fuel.—The rate of neutron reproduction, and therefore the number of nuclear reactions occurring in a reactor, depends upon the fissionability of the fuel. Some atoms split more readily than others. Although the chemist long supposed that each element was uniform when pure, the nuclear physicist demonstrated that a single element may have several forms, called “isotopes”. When uranium is in its natural state, there is a total of 238 protons and neutrons in the nucleus of nearly all atoms (U^{238}). A small percentage (about 0.7%) of a uranium isotope which has only 235 protons and neutrons in the atom is also present (U^{235}). U^{235} is much more fissionable than U^{238} . Consequently, if one separates the isotope U^{235} out of refined, natural uranium and then brings the proper quantity together, he may produce a self-sustaining chain reaction with smaller quantities and less difficulty than

with natural uranium. He may also achieve a reproduction rate high enough and fast enough to cause an explosion, if that be his desire.

Breeding.—Since the atomic scientists first worked with natural uranium, a low quality atomic fuel, they were anxious to reduce the capture of free neutrons so as to achieve a rate of neutron reproduction greater than unity, thus making the chain reaction self-sustaining. To cause an explosion a much higher rate of reproduction was required. But the capture of free neutrons may produce highly useful products. Thus, where fission occurs in a quantity of uranium containing both U^{235} and U^{238} , the relatively nonfissionable U^{238} will capture a percentage of the free neutrons. The U^{238} , which is plentiful, is turned into U^{239} by the addition of the captured neutron to its nucleus; it then emits two beta particles and becomes Plutonium (Pu^{239}). Pu^{239} is highly fissionable; it therefore makes an excellent atomic fuel. Its production in a reactor would tend to reduce the net rate of consumption of high-grade fissionable materials, even though the rate of consumption of U^{235} exceeded the rate of production of Pu^{239} . In fact, it has proved feasible to build a reactor in which more Pu^{239} is produced than U^{235} is consumed, thus resulting in a net gain in high-grade fissionable materials. The process is like starting an automobile trip with a quantity of crude petroleum and a half-full gasoline tank and, without buying gas, returning with somewhat less crude oil but the gasoline tank now full. The process is called "breeding". The ability to

breed will be one of the great virtues of the power reactor involved in the present case.

While the use of slow neutrons increases the efficiency of the chain reaction as described above, enabling a reactor to operate with less fuel, it interferes with breeding. Fast neutrons are more efficient for the production of fissionable material, principally because they are not easily captured by other substances. Accordingly, in the present state of the art, whether one employs a moderator depends partly upon his purpose. If his greatest concern is with generating power, he may use a moderator and slow the neutrons. If he wishes to produce fissionable materials more efficiently, he will want fast neutrons to accomplish the breeding. Thus, the description "fast breeder reactor," which is correctly applied to the reactor involved in the present case, means only that it is a reactor which uses fast neutrons and produces more high-grade fissionable material than it consumes.

The scientists working at Stagg Field in 1942 were not concerned with breeding. Seeking to demonstrate that a controlled fission chain reaction was possible, they used natural uranium (U^{238} with very small quantities of U^{235}) arranged in lumps and separated by graphite as a moderator. The critical size was large—the reactor was literally an atomic pile upon the floor of a squash court. The rate of reproduction and power level were controlled by long steel rods containing boron. Since there was no shield

to prevent the escape of radiation, the Chicago pile was never allowed to run at high levels.

Atomic Bombs.—Scientific progress has moved from Stagg Field along two paths. First, there was the atomic bomb. The bomb used the energy released by simultaneous fission of many atoms to cause an explosion. The explosion required a very high rate of neutron reproduction, much higher than the rate in a reactor. It was necessary to bring highly fissionable materials together with very great rapidity into a mass much greater than the critical size for sustaining a chain reaction. This cannot happen in a power reactor. There is absolutely no danger of any accident resembling an atomic bomb explosion.

Power Reactors.—The second line of progress has been in the development of atomic reactors for peaceful purposes—research, manufacture of isotopes, propulsion, and production of electricity. Perhaps the most important ultimate potential purpose is electric power. Even in the United States the supply of fossil fuels is not unlimited, and important areas are too far away to use hydroelectric power. The demand for power is still growing rapidly. Abroad there are vast numbers of people who cannot realize their economic expectations and build stable communities without adequate sources of power. Many of them lack water power and have no access to coal, oil or natural gas. Even if these fuels were available, the transportation costs would be prohibitive. Since tiny quantities of atomic fuel will produce vast amounts of energy, the power reactor gives promise of filling

a tremendous human need. Its long-run economic and social importance can hardly be exaggerated.

There are already some 115 reactors operating in the United States with diverse designs, purposes and power levels. About 90 more are under construction. Of these, 4 in operation and 11 being built are large-scale developmental power reactors, which produce and deliver electric power for use in a normal utility system. The PRDC reactor will be the first fast neutron breeder among the privately owned developmental power reactors; the others are thermal (i.e. slowed-neutron) reactors of various types and designs. See *Nuclear Reactors Built, Building or Planned in the United States as of June 30, 1960*, TID 8200 (AEC, 2d Rev. 1960). The early reactors, as well as some of the later, are owned by, or operated under contract with, the Atomic Energy Commission or the United States Department of Defense. In the Atomic Energy Act of 1954, however, Congress adopted the policy of encouraging widespread private participation in the development and utilization of atomic energy for peaceful purposes "to the maximum extent consistent with the common defense and security and with the health and safety of the public" (Section 3(d)). The Act authorizes the AEC to issue permits for the construction of atomic power plants (Section 185) and licenses for operation (Section 104(b)).

2. THE PRDC POWER REACTOR

On January 6, 1956, Power Reactor Development Company (hereinafter called "PRDC") submitted an

application for a license to design, construct and operate a developmental fast-neutron breeder reactor for the generation of electric energy at Lagoona Beach, Michigan, about 30 miles southwest of Detroit. PRDC is a non-profit membership corporation composed of utility⁵ and industrial companies,⁶ which was organized in 1955 "to study, develop, design, fabricate, construct and operate one or more experimental nuclear power reactors * * * to the end that there may be an early demonstration of the practical and economical use of nuclear energy for the generation of electrical energy * * *" (R. 388).

The heart of the plant covered by the application, as amended, is to be a core containing the fissionable materials (or atomic fuel). It will be an upright cylinder 31.5 inches high with a 30.5 inch diameter. The fuel will be in the form of very fine, solid but

⁵ PRDC has 13 operating utility members, and one service company representing four additional public utilities. These companies are: Central Hudson Gas & Electric Corp.; The Cincinnati Gas & Electric Co.; The Columbus and Southern Ohio Electric Co.; Consumers Power Co.; Delaware Power & Light Co.; The Detroit Edison Co.; Iowa-Illinois Gas and Electric Co.; Long Island Lighting Co.; Philadelphia Electric Co.; Potomac Electric Power Co.; Rochester Gas and Electric Corp.; The Toledo Edison Co.; Wisconsin Electric Power Co.; and Southern Services, Inc., representing The Southern Co. and its following four operating subsidiaries: Alabama Power Co.; Georgia Power Co.; Gulf Power Co.; Mississippi Power Co. (R. 722-723; Opinion, R. 681-682, n. 69).

⁶ There are 7 industrial companies: Allis-Chalmers Mfg. Co.; The Babcock & Wilcox Co.; Burroughs Corp.; Combustion Engineering, Inc.; Fruehauf Trailer Co.; Holley Carburetor Co.; Westinghouse Electric Corp. (R. 722-723).

removable uranium pins running the length of the cylinder, 27% enriched in the fissionable isotope U^{235} , clad in zirconium and held in stainless steel subassemblies. There is no moderator. Two boron control rods are near the center. In addition, there are eight boron shut-down rods which would hang above the core during operation, ready for insertion to shut down the chain reaction by capturing neutrons if the occasion should arise. The shut-down rods are suspended by latches held by an electro-magnet so that the current can be shut off automatically and the shut-down rods will instantly fall into the reactor without human intervention if operation becomes abnormal.

The cylindrical core is surrounded by an axial and radial blanket composed of uranium from which the isotope U^{235} has been removed and which is arranged in removable elements. When the reactor is operating this blanket will not only serve as a shield to prevent the escape of radio activity released by fission but it will also capture free neutrons producing first the isotope U^{239} and then plutonium (Pu^{239}). It is this characteristic which makes the plant a breeder. The core and blanket together form a cylinder about 65 inches long and 80 inches in diameter.

The core and the surrounding blanket of nonfissionable material (U^{238}) are surrounded and covered by a series of shielding layers and containment vessels, the outside wall consisting of concrete seven feet thick and, beyond that, a steel shell.

For the PRDC design, see R. 666-668, and Exhibits X, X-A to the PRDC application (Certified Transcript, pp. 5197-5302, 5605-5713).

When operating, the reactor will produce energy resulting from fission in accordance with the formula $E=mc^2$, most of which will be transformed into heat. To obtain electricity the heat must be efficiently transformed into steam with which to turn a conventional turbine generator. The PRDC plans call for pumping molten sodium through the core as coolant. The coolant will be sealed in a tight container but the system is so arranged that after passing through the reactor core the coolant moves through primary heat exchangers and thence, at reduced temperatures, back to the core. The heat exchanger transfers the heat from the primary coolant system to a secondary system which also uses liquid sodium. The second system carries its liquid sodium to the steam generators and the steam, in turn, moves the turbines just as if it were created in a boiler fired by coal. Sodium is used as a coolant because it is an efficient heat transfer agent and neither slows nor absorbs enough neutrons to affect either the breeding or the chain reaction. Two cooling systems are used in order to reduce the danger of the escape of radiation.

The PRDC reactor is to have a rated capacity of 300,000 kilowatts of heat, which will yield 100,000 kilowatts of electricity; at the same time, it will produce 20 percent more fissionable material than it consumes. Since the success of a fast breeder will increase the nuclear fuel available from natural sources more than a hundred times, it is one of the most "promising" approaches to feasible atomic power at the present time and its success seems "indispensable" to the future development of the wide-

spread use of such power. See R. 709, 737-738, 804-808, 831-832.*

The safety hazard of the PRDC reactor—like that of any other power reactor—is not that it could explode like an atomic bomb, but that it might release radioactive material into the atmosphere. As the eminent atomic physicist Professor Hans Bethe explained in this case (R. 739), “it is * * * impossible that the reactor ever explode like an atomic bomb. There is no way in which this could ever happen.”

The trigger of an atomic bomb is especially designed to force critical quantities of very highly refined fissionable materials together in a few millionths of a second, thus causing a very rapid chain reaction in which tremendous quantities of energy are immediately released. The atomic fuel in a reactor is usually not so highly refined. There is no trigger for forcing it into a critical mass in the short space of time. If a nuclear accident should happen in a reactor it would be “at the worst, comparable to a boiler explosion” (R. 750).

Thus the hazards of nuclear reactors lie in the possibility that radioactive fission products which have been formed by the operation of the reactor may escape into the atmosphere and cause a radiation hazard

* The fast neutron breeder reactor was one of the types described to Congress during the hearings on the Atomic Energy Act of 1954 as a possible method for economic production of electricity from atomic power. See Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., pp. 493-494, 565, 568, 2 Leg. Hist. 2127-2128, 2203, 2206; 100 Cong. Rec. 10432-10433, 3 Leg. Hist. 3253-3254.

for the surrounding area. (R. 739; see also R. 741-742, 750, 798, 876-877.)

In normal operation, the radioactive fission products are confined in the fuel elements in the reactor. Escape of such material could hypothetically result from a series of mechanical failures of the fuel elements, the reactor vessel and other containment features (R. 742-743), or from a nuclear accident in which there occurs a rapid increase in the rate of neutron reproduction, an overheating and melting of the fuel, and a release of gases and energy sufficient to breach the containment (R. 744).

All reactors, including fast neutron breeders, have a series of cumulative safeguards to insure that no single failure of equipment or error or omission could cause an accident (R. 740, 881-886). Thus, the reactor core must be designed so as to be inherently stable and easily controlled; and it is built so that it will automatically shut down if specified operating levels well below any danger point are exceeded. In most reactors, as in the one here involved, the fissionable material used as fuel is loaded in the form of solid elements fixed in a rigid structure and a number of movable rods containing a neutron absorber are used to regulate power and to shut down operation (R. 735-736). The configuration of the reactor fuel and control rods is fixed to provide control and margins of safety. The design may include limitations upon the rate at which reactivity (the rate of neutron reproduction) can be increased, and thus avoid an uncontrollable rise in power (R. 746, 750-751). Fur-

ther, the reactor core is designed to make any such incident self-limiting, in that increases in temperature or power should decrease reactivity (R. 754, 759, 881). Moreover, aside from the use of control rods by the operator to regulate power and shut down the reactor, there are "scram" mechanisms which will automatically cause shut-down if specified levels of operation are exceeded, and will "fail safe", i.e., shut down if the scram device itself is not functioning properly (R. 744-745).

At the time the PRDC construction permit was granted, the design of fast breeder reactors had not been perfected up to the foregoing standards although the Atomic Energy Commission, as explained below, found that in all probability the difficulties could be solved. The special characteristics of fast neutron reactors pose three particular hazards not associated with thermal reactors. *First*, if the neutron reproduction rate were to increase beyond a certain level, the power would rise more rapidly than in a thermal reactor (R. 750, 797-798, 808). *Second*, there may be certain instabilities in the core of a fast reactor, with the possible consequence that a rise in power would not be self-limiting, but would lead to further progressive power increases (R. 671-672, 704, 753-759, 795, 838-839). *Third*, since the core of a fast reactor contains a large amount of fissionable material in a small volume, a rapid melting of the core and a concentration of the molten fissionable material into much

more than a critical mass, could cause a boiler-type explosion (*supra*, p. 15) (R. 670, 752-753, 833-834).⁹

It is unnecessary to explain these problems in any detail save to point out as an illustration that instability in the core may be caused by the pins of fissionable material bowing inward as the heat in the reactor rises. Rearrangement of the fissionable materials might then increase the rate at which neutrons were reproduced (see p. 6, *supra*), and thus the bowing might conceivably cause a nuclear run-away before the reactor could be shut down. Manifestly, this problem of design would have to be solved before a fast breeder reactor could be permitted to operate at the PRDC location.¹⁰

A power reactor has further cumulative safeguards

⁹ There are, on the other hand, important respects in which a fast reactor may be safer than a thermal one. Because fast neutrons are not easily captured by fission products and other materials, it is not necessary to build in a large potential neutron reproduction rate to override such effects; unlike thermal reactors, fast reactors can be fueled so that no rapid uncontrolled rise in power is possible (R. 672, 704-705, 748-749, 797). In addition, the fast reactor's short fuel-loading cycle minimizes the amount of fission products, and the system's low pressure minimizes mechanical stress (R. 741, 753-754).

¹⁰ The Commission is now operating one experimental fast breeder reactor (EBR-I) (R. 786-796, 828-830, 835-839), and is constructing a second such experimental facility (EBR-II) (R. 804-815, 839-841). It also has had a number of such reactors used for research purposes which operate on a small scale without any production of power (R. 822-827, 841-845). The United Kingdom Atomic Authority has an active fast breeder program and its first developmental fast breeder power reactor commenced operation at Dounreay, Scotland, in November 1959 (see R. 738, 851-852). See the Commission's opinion, R. 669, 702.

to prevent injury even if an accident occurs in the core. Physical barriers contain the fission products within fuel elements in the reactor core; the reactor core is covered by a steel vessel; it has a massive radiation shield and, in some cases, as here, a gas-tight reactor compartment; and it is housed in its own building. In addition, all power reactors not located in remote areas are further enclosed in a steel vapor shell designed to contain all gaseous fission products which could be released in the maximum credible accident. (R. 742-744, 881-882, 884.)

Thus far, there have been no injurious accidents in the routinely-operating reactors. Prior to 1961, the incidents that had occurred in experimental facilities had not resulted in any fatality or in any injury to the public. (See R. 351, 878-881.) On January 3, 1961, an explosion occurred at an experimental nuclear reactor at the Naval Reactor Testing Station, Arco, Idaho, as a result of which three servicemen inside the reactor building were killed. This first fatal accident is now under investigation. While the cause has not yet been determined, it does appear that no significant radioactive material was released beyond the reactor area, even though the reactor was not enclosed in a vapor shell.

3. PROCEEDINGS BEFORE THE COMMISSION

On August 4, 1956, seven months after receipt of the PRDC application, the Commission issued a provisional construction permit, subject to the right of any interested party to request a hearing (R. 516-

523). The labor unions which are respondents in this Court and certain of their officers filed petitions for intervention requesting a hearing. The petitions were granted (R. 576-583). A lengthy hearing was held before a hearing examiner. The chief issues—the only issues relevant here—related to the safety of the proposed reactor. At the close of the hearing the record was certified to the Commission. After hearing oral argument, the Commission issued an opinion and initial decision affirming and continuing in effect the construction permit, with amendments (R. 607-629, 918-938). Following the filing of exceptions and further briefs, the Commission issued an Opinion and Final Decision and an Order (R. 630-720), which “amplif[ied] and affirm[ed]” its initial decision (R. 631).

The decision rejected the unions’ contention that no construction permit should be issued because there was insufficient foundation in the record for a finding that the proposed reactor could be operated with “adequate protection to the health and safety of the public” (Section 182(a)). The Commission proceeded upon the view that, since the issue related only to a construction permit under Section 185, no final conclusion upon the safety of operations was required. Its opinion contains numerous subsidiary findings pertaining to the safety of the projected operation and concluded (R. 708)—

The Commission finds reasonable assurance in the record, for the purposes of this provisional construction permit, that a utilization facility of the general type proposed * * * can be con-

structed and operated at the location without undue risk to the health and safety of the public.

The strictness of the Commission's definition of "undue risk" is revealed by another finding. It ruled that a definitive finding that there was no "undue risk", which would have to be made before a license to operate the reactor was granted, would require proof of (R. 707)—

the inherent safety of the reactor and a demonstration that no credible accident can release significant quantities of fission products into the atmosphere. * * *

Although the Commission found "reasonable assurance" that this proof would be forthcoming, it repeatedly stated that it will not issue an operating license unless, after another full hearing, it is satisfied that operation will satisfy the Act's safety criteria (R. 634-635, 650, 676, 679-680, 712, 716, 718-719). It emphasized (R. 646-647) that "public safety is the first, last, and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a nuclear facility."

The Commission thereupon continued the amended construction permit. The permit expressly stated that it did not constitute final approval of any technical specification, which approval would be required before an operating license is issued (R. 716), and expressly reserved jurisdiction to reopen the proceeding at any time prior to the issuance of an operating license for further evidence and for consideration of data pertinent to safety (R. 712, 714, 718-719).

4. THE DECISION OF THE COURT OF APPEALS

Upon respondents' petition for review the court of appeals set aside the order granting a construction permit. The majority ruled (1) that the respondent unions had standing to maintain the action, and that the Commission's grant of the permit was invalid because the Act requires the agency, before it grants a construction permit, to make the same finding of safety of operation that it makes before granting an operating license; (2) that the Commission's safety findings were ambiguous because they failed to state "a positive opinion regarding safety of operations"; and (3) that the findings were deficient because the Commission did not specifically find that there were "compelling reasons" for locating the reactor near a heavily populated area "where it will expose so large a population to the possibility of a nuclear disaster" (R. 953-965). Judge Burger dissented (R. 965-968).

Petitions for rehearing *en banc* were denied (Judges Miller and Bastian dissenting, and Judges Washington and Burger not participating) (R. 970-971).

SUMMARY OF ARGUMENT

I

The Commission's order granting PRDC a construction permit—not an operating license—for a developmental atomic power reactor is based upon a finding of "reasonable assurance * * * that a utilization facility of the general type proposed * * * can be constructed and operated at the location without undue risk to the health and safety of the public"

(R. 708). The Commission further stated that before issuing an operating license it would "require that all safety questions be answered to our complete satisfaction" (R. 634-635). The Commission here followed the same practice as in all the other cases in which it authorized the construction of developmental power reactors: granting a construction permit upon a finding of reasonable assurance of the operating safety of the type of reactor proposed, but deferring a definitive determination of the operating safety of the particular reactor design actually built to the proceedings for the operating license. We submit that this two-step procedure accords with the Atomic Energy Act of 1954 and the Commission's regulations, and that the court of appeals erred in holding that the same findings required for the issuance of an operating license must be made before granting a construction permit.

A. 1. One of the basic purposes of the Act was "to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes" by the Nation's industrial and utility firms (Section 3(d)). The keystone of the Act's detailed regulatory system is Commission licensing of atomic production and utilization facilities. Section 185 provides a two-step procedure for licensing the construction and operation of reactors: the initial issuance of a construction permit "if the application is otherwise acceptable to the Commission," and the subsequent grant of an operating license if certain conditions are satisfied.

2. A basic concern of Congress evidenced in this Act was to insure maximum protection for the public health and safety in the development of the peaceful uses of atomic energy through regulations and findings to be made by an expert body—the Atomic Energy Commission. Both Sections 103 and 104, which authorize the Commission to issue reactor licenses, and Section 182(a), which prescribes the content of applications for licenses to operate production or utilization facilities, require the Commission, before it grants a license, to find that there will be adequate protection to the public health and safety. When Congress confided to the Commission the task of protecting the public health and safety, it did not attempt to lay down detailed instruction for dealing with this highly specialized, technical and scientific subject, but gave the agency broad authority to formulate more precise requirements through the exercise of rule-making power. Sections 161(b), 161(i).

The broad power thus conferred upon the Commission encompasses the entire spectrum of health and safety regulation. It plainly includes the establishment of safety standards and procedures, including the prerequisites to be met at various stages in the licensing procedure.

B. Pursuant to the legislative design the Commission promulgated regulations designed to protect the public health and safety in all aspects of the development and use of atomic power. The regulations distinguish between the preliminary safety finding to be made before issuing a reactor construction permit

and the ultimate finding which is required for an operating license. Regulation 50.35 provides that where, "because of the nature of a proposed project," an applicant is unable to provide the necessary technical information, including final data bearing upon health and safety, the Commission may grant a construction permit on a provisional basis if it has information sufficient to provide reasonable assurance that a facility of a proposed type "can be constructed and operated at the proposed location without undue risk to the health and safety of the public"; and that, prior to issuance of an operating license, the Commission will determine whether the "final design" provides reasonable assurance that public health and safety will not be endangered.

The reasons for adopting this two-step procedure with respect to safety are inherent in modern scientific methods and the present state of the art. In the scientific world, one can often predict with a substantial degree of assurance the development of knowledge, engineering techniques and materials before they are actually available. Where both the construction of the facility and the final development of design and materials will cover a considerable period, the public acquires the benefits of the facility much earlier if both the construction and the research and development go forward simultaneously. Furthermore, there are often uncertainties and technological problems that can be resolved only during the course of construction. For these reasons, a definitive safety evaluation frequently cannot be made

until the completion of construction and final testing. When the Commission issues a provisional construction permit for a developmental reactor, the most it can do is to make a finding of reasonable assurance that a reactor of that type can be safely constructed and operated at the proposed site.

C.1. The two-step procedure provided in Regulation 50.35 is authorized by Section 185 of the Act. That section expressly provides for the issuance of construction permits and operating licenses, in two steps, and it obviously contemplates different standards for each step. The only condition imposed upon the grant of a construction permit is that the application be "otherwise acceptable to the Commission." For a subsequent operating license, however, Section 185 specifies conditions, including a finding that the facility will be operated in conformity with the applicable statutory provisions and regulations, and the "absence of any good cause being shown" why the granting of a license would not accord with the Act. The latter standards were intended to assure that the statutory criteria for safe operation would be met before an operating license is issued. The absence of specific standards governing the grant of construction permits were evidently designed to give the Commission the broadest discretion in formulating appropriate safety standards at this stage of the proceeding. This is further shown by Section 182, which requires that the statutory safety standard of providing adequate protection to the public health and safety must be satisfied before a license "to operate" may be is-

sued. Had Congress intended in Section 185 to apply the same standard to the grant of a construction permit, which does not authorize operation, it would have said so.

2. Apart from Sections 182 and 185, Regulation 50.35 is also valid as a reasonable exercise of the Commission's broad rule-making power to "prescribe such regulations or orders as it may deem necessary * * * to protect health and to minimize danger to life or property" (Section 161(i)). The scientific and technological factors previously described (*supra*, pp. 25-26) fully justify deferring the determination of final operating safety until construction is completed. Such deferral enables the Commission to make that determination on the basis of the latest scientific and technological information.

3. The legislative history of the 1954 Act confirms the view that definitive safety findings are not required for the issuance of a construction permit. The provision in Section 185 imposing, as one of the conditions for the grant of an operating license, "the absence of good cause being shown" why the grant of such license would not accord with the Act, gives the Commission the power to deny a license even though construction is carried out in accordance with the permit. This was a deliberate departure from the Communications Act of 1934, under which all definitive decisions with respect to the application must be made when the agency issues a construction permit. Congress rejected a proposal that the "good cause" provision of the Atomic Energy Act should be changed

so that all fundamental determinations should precede construction and that a license should be assured when construction is completed. Since the Act thus contemplates some further determination before an operating license is issued, it cannot be read to compel a definitive safety finding prior thereto.

When read in context, the two items of legislative history invoked by the court below as the basis for its decision are not in point. The principal item, a colloquy between Senators Humphrey and Hickenlooper, had nothing to do with the safety features of the bill, but related to economic issues concerning the public or private development of atomic electric power.

4. Any doubt concerning our interpretation of the Act should be removed by the Commission's frequent reports to the Joint Congressional Committee on Atomic Energy, which described and explained the Commission's two-step practice of issuing provisional construction permits without making definitive safety findings, and the Committee's apparent acquiescence in the practice.

D. In Finding 22 the Commission concluded (R-708):

The Commission finds reasonable assurance in the record, *for the purposes of this provisional construction permit*, that a utilization facility of the general type proposed in the PRDC Application and amendments thereto can be constructed and operated at the location without undue risk to the health and safety of the public. [Emphasis added.]

Apart from the italicized phrase "for the purposes of this provisional construction permit," this finding uses the very words of Regulation 50.35. The court below thought, however, that the italicized phrase in Finding 22 (also used elsewhere in the Commission's decision) so weakened the Commission's "reasonable assurance" finding that neither the Act nor the Regulation was satisfied.

We submit, however, that the italicized phrase was not intended to, and did not, derogate in any way from the basic finding, repeated several times without the reference (R. 665, 676-677, 710-711), that there was reasonable assurance that a reactor of this general type could be operated at this site without undue risk to public health and safety. The phrase served two purposes. First, it reemphasized and made particularly explicit, in the Commission's first contested reactor construction licensing case, that the grant of the construction permit was not to be taken as any indication that the safety findings there made would automatically lead to an operating license. Second, it underscored the Commission's ruling that the issuance of a construction permit required no more than the finding set forth in Regulation 50.35 as to the type of reactor, and did not require a definitive safety evaluation of the particular reactor. Indeed, whenever the Commission finds, in issuing a construction permit, that there is reasonable assurance that a facility of the type proposed can be operated consistently with the public health and safety, such finding is necessarily

made for the purposes of the particular construction permit involved.

The court of appeals erred in holding (R. 963) that the Commission's findings are ambiguous because of the Commission's "repeated expressions of uncertainty" on the one hand, and its "positive opinion regarding safety of operation" on the other. The alleged ambiguity involves no more than the distinction, clearly drawn in the regulations, between the two types of findings made by the Commission in granting a construction permit for a developmental reactor; a present conclusion (the "positive opinion") as to the safety of the general type of reactor proposed, and a more tentative conclusion (the alleged "expressions of uncertainty") as to the eventual demonstration of the safety of the "final design" in the light of the applicants' research and development program.

The Commission's ultimate safety findings rest on a number of subsidiary findings covering the various factors relevant to that issue, and these subsidiary findings are supported by an extensive record which contains detailed evidence relating to all aspects of the PRDC reactor. The respondents do not challenge the sufficiency of the supporting evidence.

II

Neither the language nor the legislative history of the Act justifies the court of appeals' ruling that the Commission cannot locate a reactor near a populated area unless it finds "compelling reasons" there-

for. Both support the Commission's settled practice of treating the site as one of the many factors upon which its overall ultimate judgment as to operating safety is based. Furthermore, the court's statement that the location of the PRDC reactor approximately 30 miles from Detroit will "expose" a large "population to the possibility of a nuclear disaster" has no support in, and is contradicted by, both the Commission's findings and the evidence upon which they rest.

1. The only statutory test concerning safety which Congress has established as the prerequisite to the grant of a construction permit, or even of an operating license, is a general finding of adequate protection to the public health and safety. Sections 104(d), 182(a). This statutory finding requires an evaluation of many factors, including the nearness to a populated area; it is for the Commission, however, to determine the weight to be given to this factor, as well as to all the others, in making the statutory finding.

Nothing in the statute justifies the court of appeals' special subordinate finding of "compelling reasons" for locating a power reactor in a populated area. On the contrary, the Act explicitly delegates to the Commission the responsibility for determining whether a particular plant location will provide adequate protection for the public health and safety. Sections 161(i)(3), 182(a). Pursuant to these provisions the Commission has issued Regulation 50.34, which requires submission of detailed information relating to the safety characteristics of the site.

In the present case the Commission gave careful attention to the proposed location; and its ultimate finding of safety was based, among others, on the finding of reasonable assurance that a reactor of a proposed type can be constructed and operated "at the location" without undue risk to public health and safety. Respondents do not attack these findings and, in any event, there is substantial evidence to support them.

2. One of the basic purposes of the Act was to foster progress in atomic power development by encouraging the widespread participation of private industrial and utility companies and publicly-owned utilities. Effective participation by utilities, however, may be curtailed if large power reactors must be located in remote areas and cannot be placed in the utility service areas, or within a reasonable distance to provide feasible service to the utilities' metropolitan and industrial consumers. The Act thus implicitly recognizes that there are strong counterbalancing factors that offset the greater safety that would necessarily result if every reactor were located in a remote area. Of course, the proximity of the population demands a higher degree of safety. The Commission acknowledged this and took it into account in its decision.

3. The Commission's procedure in this case followed the same course as in all other applications to license the construction or operation of a reactor. Construction permits for such reactors have been issued after full consideration of all the pertinent criteria

that bear upon safety at the proposed site, but the Commission has never made a special finding of "compelling reasons" for locating a reactor near a populated area. Location 30 miles from a large center of population has never been considered disqualifying *per se*, although it may call for certain additional design features or the imposition of conditions upon operation—as the Commission may require in the instant case before authorizing operation.

4. The Commission's policy on reactor location is explicitly validated by the legislative history of the Act. Congress contemplated that the safety regulation it was committing to the Commission's discretion included supervision of the location of reactors. Congress also understood, and anticipated, that many power reactors (like conventional generating facilities) would be located near metropolitan centers during the developmental stage of atomic power. There is nothing to the contrary in the 1957 Report of the Commission to the Joint Committee on Atomic Energy, mentioned by the court of appeals.

ARGUMENT

I

THE ATOMIC ENERGY COMMISSION SATISFIED THE REQUIREMENTS OF THE ATOMIC ENERGY ACT OF 1954 AND OF ITS OWN REGULATIONS IN GRANTING THE PRODC CONSTRUCTION PERMIT.

The order challenged by respondents in the court below granted only a provisional construction per-

mit—not an operating license. The order is based upon a finding of (R. 708)—

reasonable assurance * * * that a utilization facility of the general type proposed in the PRDC Application and amendments thereto can be constructed and operated at the location without undue risk to the health and safety of the public.

The finding was made only for the purposes of this provisional construction permit (R. 708). Construction creates no special hazards. The Commission also ruled that before issuing an operating license it would “require that all safety questions be answered to our complete satisfaction” (R. 634-635), and it reserved the right to consider (R. 712)—

whether the PRDC plant can be *operated* with reasonable assurance for the protection of the health and safety of the public.

Thus the safety finding made by the Commission on the construction permit differed in two respects from the finding which it will require before granting a license to operate. *First*, the construction permit finding referred to “a utilization facility of the general type proposed” whereas the operating license, if granted, would cover the specific reactor exactly as designed. *Second*, the construction permit finding contemplated a somewhat lower degree of assurance concerning safety than would be required for a license to operate. These differences are due to the nature of scientific progress and reactor construction.

Many safety problems would have to be solved, many details of the design would have to be developed and many safety tests would have to be conducted while construction was in progress. The procedure followed in this case conformed to the Commission's uniform practice in like cases.

The court of appeals held that the very findings required for the issuance of an operating license must be made before granting a construction permit. We submit that this was error and that the two-step procedure followed by the Commission accords with the statute and its own regulations.

A. THE STATUTORY PROVISIONS

One of the basic purposes of the Atomic Energy Act of 1954 was "to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes" by the nation's industrial and utility firms (Section 3(d), *infra*, p. 93). Participation by the latter in the development of reactors for the production of electricity, in "team-work" with the Government, was considered necessary "to optimum progress, efficiency, and economy in this area of atomic endeavor" (S. Rep. 1699, 83d Cong., 2d Sess., p. 9, 1 Leg. Hist. 757). "[T]he goal of atomic power at competitive prices will be reached more quickly if private enterprise * * * is now encouraged to play a far larger role in the development of atomic power" (S. Rep. 1699, 83d Cong., 2d Sess.,

p. 3, 1 Leg. Hist. 751). This new source of electric energy "should be integrated into the existing power economy of the Nation; * * * nuclear power should be produced and distributed by the private and public power systems" (Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., p. 575, 2 Leg. Hist. 2213). As the President stated in his message on the bill, the new industry should be developed "in a manner as nearly normal as possible" (H. Doc. 328, 83d Cong., 2d Sess., p. 6, 1 Leg. Hist. 50).

1. *The Licensing System.*—The Act provides a detailed regulatory system for the development of the peaceful uses of atomic energy by sources other than the Atomic Energy Commission. The keystone is a licensing system, which requires a Commission license for the manufacture, production, transfer, acquisition, possession, use, import or export of any facility for using or producing fissionable materials or reactor products (Section 101, *infra*, p. 109). Two types of licenses for utilization and production facilities (reactors) are contemplated: commercial licenses, which may be issued only after the Commission has found that the type of facility "has been sufficiently developed to be of practical value for industrial or commercial purposes" (Sections 102 and 103, *infra*, pp. 109–111); and research and development licenses (Section 104, *infra*, p. 111). The Commission is authorized to issue development licenses for power reactors, as "utilization and production facilities in-

volved in the conduct of research and development activities leading to the demonstration of the practical value of such facilities for industrial or commercial purposes", and to give "priority" to those which, it believes, will "lead to major advances in the application of atomic energy for industrial or commercial purposes". Section 104(b).

Section 182 prescribes the manner of applying for a license and certain proceedings to be held thereon.

Section 185 provides a two-step procedure for licensing the construction and operation of reactors (*infra*, p. 126). It provides for the initial issuance of a construction permit upon application "for licenses to construct or modify production or utilization facilities * * * if the application is otherwise acceptable to the Commission." Section 185 further states that, later, the Commission is to grant an operating license (under Section 103 or 104), if certain conditions are satisfied: (1) "the completion of the construction * * * of the facility"; (2) "the filing of any additional information needed to bring the original application up to date"; (3) a "finding that the facility authorized has been constructed and will operate in conformity with" the amended application and appropriate statutory provisions and regulations; and (4) "the absence of any good cause being shown to the Commission why the granting of a license would not be in accordance with the provisions of this Act."

2. *Protection of the Public Health and Safety.*—A basic concern of Congress evidenced in the Act was

to insure maximum protection for the public health and safety in the development of the peaceful uses of atomic energy. Congress found that "regulation by the United States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest * * * to protect the health and safety of the public" (Section 2(e), *infra*, p. 92). Congressional concern for the public health and safety is also set forth in Section 3(d), which states that one of the purposes of the Act is to provide for "a program to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with * * * the health and safety of the public" (Sec. 3(d), *infra*, p. 93).

The same concern is evident in the provisions which deal directly with licensing. Section 103(b) provides:

The Commission shall issue such licenses on a nonexclusive basis to persons applying therefor * * * who are equipped to observe and who agree to observe such safety standards to protect health and to minimize danger to life or property as the Commission may by rule establish; * * *

Section 104(b), from which the Commission derives the authority to issue licenses for reactors involving research and development, such as the PRDC reactor, provides that in issuing developmental licenses

[t]he Commission shall impose the minimum amount of such regulations and terms of license as will permit the Commission to fulfill its

obligations under this Act * * * to protect the health and safety of the public * * *.

A license may not be issued if, in the opinion of the Commission, its issuance would be "inimical to the * * * health and safety of the public." Section 104(d).

Section 182(a), which prescribes the content of applications for licenses to operate production or utilization facilities, requires the following information concerning safety—

such technical specifications, including information of the amount, kind, and source of special nuclear material required, the place of the use, the specific characteristics of the facility, and such other information as the Commission may, by rule or regulation, deem necessary *in order to enable it to find* that the utilization or production of special nuclear material * * * *will provide adequate protection to the health and safety of the public.* * * * [Emphasis added.]

As these sections show, Congress confided to the Commission the task of protecting the public health and safety. The problems are highly specialized, technical and scientific. Therefore Congress did not attempt to lay down detailed instructions but gave the agency authority to formulate more precise standards through the exercise of rule-making power. Section 161(b), *infra*, p. 116, authorizes the Commission to

establish by rule, regulation, or order, such standards and instructions to govern the possession and use of special nuclear material,

source material, and byproduct material as the Commission may deem necessary or desirable * * * to protect health or to minimize danger to life or property.

Section 161(i), *infra*, p. 116 authorizes the Commission to

prescribe such regulations or orders as it may deem necessary * * * (3) to govern any activity authorized pursuant to this Act, including standards and restrictions governing the design, location, and operation of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property.

Sections 53(e) and 81 (*infra*, pp. 101-102, 108-109) make licenses for special nuclear and byproduct material subject to "such safety standards as may be established by rule of the Commission. * * *"

And, as pointed out above, Section 103(b)(2) provides for the granting of non-exclusive commercial licenses for utilization or production facilities to persons "who are equipped to observe and who agree to observe such safety standards to protect health and to minimize danger to life or property as the Commission may by rule establish."

Thus Congress gave the Commission broad power to establish the requirements necessary to protect life, health and property in the development and use of atomic energy for peaceful purposes. The very breadth of the phrases demonstrates that the Commission's delegated authority encompasses the entire spectrum of health and safety regulation—the formu-

lation of policies, the evaluation of scientific information, the fixing of standards and their application to specific cases. This power, we submit, plainly includes the establishment of safety standards and procedures including the prerequisites to be met at various stages in the licensing procedure.

Congress adopted this course because it recognized that protection of the public health and safety in the atomic energy field was an area of "special competence" in which the "responsibility" of the Commission (100 Cong. Rec. 10079, 3 Leg. Hist. 3103) could best be accomplished through the agency's rule-making powers.¹¹ As the President stated, in recommending to Congress the legislation that became the 1954 Act, "flexibility is necessary in licensing and regulatory provisions of the legislation. Until further experience with this new industry has been gained, it would be unwise to try to anticipate by law all of the many problems that are certain to arise." H. Doc. 328, 83d Cong., 2d Sess., p. 7, 1 Leg. Hist. 51.

¹¹ That the Commission was intended to use its rule-making power to carry out its broad discretion to protect the public health and safety was clearly noted in references to Section 161 during the legislative consideration of the 1954 Act. See S. Rept. 1699, 83d Cong., 2d Sess., p. 26, 1 Leg. Hist. 774; H. Rept. 2181, 83d Cong., 2d Sess., p. 26, 1 Leg. Hist. 1022; Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., pp. 465, 601, 2 Leg. Hist. 2099, 2239; H. Doc. 328, 83d Cong., 2d Sess., p. 7, 1 Leg. Hist. 51.

B. THE COMMISSION'S REGULATIONS AND PROCEDURES

Pursuant to the legislative design the Commission promulgated detailed regulations designed to protect the public health and safety in all aspects of the development and use of atomic power. The regulations pertinent to the construction and licensing of atomic reactors are Regulations 50.34, 50.35 and 50.40 (10 CFR 50.34, 50.35, 50.40, *infra*, pp. 133-136).

Regulation 50.34 specifies the technical information to be contained in each application for a license or construction permit. The required information includes a description of the process to be performed that is "sufficiently detailed to permit evaluation of the radioactive hazards involved" (§ 50.34(a)); a detailed description of the site for the facility (§ 50.34(c)); a "description of plans or proposals in the event that acts or accidents occur which would create radioactive hazards" (§ 50.34(e)); and an "evaluation of the proposed measures and devices to prevent acts or accidents which would create radioactive hazards or to protect against the consequences should such acts or accidents occur" (§ 50.34(g)). Upon the basis of all this information, the Commission makes its determination with regard to the public health and safety.

The regulations distinguish between the ultimate safety finding to be made before issuing a construction permit and that which is required for a license to operate. Regulation 50.35 provides that where, "because of the nature of a proposed project," an applicant is unable to provide the necessary technical information, including final data bearing upon health

and safety, the applicant shall indicate the reason for such omission and the date when it will be supplied, and that

If the Commission is satisfied that it has information sufficient to provide reasonable assurance that a facility of the general type proposed can be constructed and operated at the proposed location without undue risk to the health and safety of the public and that the omitted information will be supplied, it may process the application and issue a construction permit on a provisional basis without the omitted information subject to its later production and an evaluation by the Commission that the final design provides reasonable assurance that the health and safety of the public will not be endangered.

It will be observed that there are two chief differences between the safety findings required for a provisional construction permit and those prerequisite to an operating license. First, the finding for a permit covers only "a facility [*i.e.*, a reactor] of the general type proposed" whereas the license will not be issued until the Commission is satisfied that "the final design" provides reasonable assurance that operation of the reactor will not endanger the public. Second, the degree of safety assurance required for the permit is somewhat less. It calls for an informed prediction concerning what can be done on the site—a prediction made with full knowledge that the design is not complete and that full information is lacking. At this stage an investment is at stake, and private, and some-

times public resources are committed, but there is no threat to health or safety. The construction of a reactor presents no dangers. Its operation would, however, endanger the public unless there is full assurance of its safety. Consequently, the Commission warns applicants, as it repeatedly told PRDC (R. 634-635, 649-650, 676, 679-680, 712, 716, 718-720), that the issuance of a permit does not imply any commitment to an operating license. And Regulation 50.35 requires the strongest kind of finding as to safety before the license to operate will be issued.

The Commission has regularly followed this procedure in licensing reactors. It has been applied to every developmental power reactor and to most research and testing reactors.¹²

¹² The licensed developmental power reactors are listed in Appendix B, *infra*, pp. 137-138. When the PRDC construction permit was issued, and up to the time of the decision here under review, construction of all the other (eight) developmental power reactors had been authorized under provisional construction permits on the basis of the same 50.35 procedure and findings followed in this case. Subsequent to the court of appeals' decision in this case and in a stated attempt to comply with it, a Commission hearing examiner, in an intermediate decision granting a construction permit, made not only the finding as to the safety of the general type of reactor required by Regulation 50.35, but also a finding as to the safety of the particular design described in the application. However, he further pointed out that there were specific safety questions that had not yet been resolved and on which information would have to be submitted before an operating license could be issued. *Pacific Gas & Electric Co.*, AEC Docket No. 50-133, October 17, 1960, pp. 47-50. This decision became final in the absence of exceptions or action by the Commission on its own motion.

The Commission also reviews its own developmental power reactors (*infra*, pp. 138-139) in proceedings similar to licensing proceedings. AEC Public Announcement B-42, March 12, 1961.

The reasons for adopting this two-step procedure with respect to safety are inherent in modern scientific methods and the present state of the art. It is commonplace in the scientific world that one can often predict with a high degree of assurance the development of knowledge, engineering techniques or materials before they are actually available. This is especially likely to be true where the basic research has been completed and theoretical calculations can be projected in advance of construction and testing. Where both the construction of a facility and the final development of design or materials will cover a considerable period, the public acquires the benefits of the facility much earlier if both the construction and the research and development go forward simultaneously. Furthermore, there are often uncertainties and technological problems which can be resolved only during the course of construction. As Dr. Mark Mills testified in the present case, "Practically all advanced technological developments take place with a sort of combined construction and research and development and necessary dovetailing of these things * * *" (R. 73-74).

These generalizations apply to atomic science. Dr. Hans Bethe testified, "The simultaneous pursuit of programs of research, development and construction has become standard in the fast-moving field of atomic energy" (R. 739). So swift-moving is the technology of atomic power reactors, that a preliminary proposed design is normally submitted with the understanding that many features "will be determined and demonstrated during its actual construction" (R. 668, 676).

The design will be changed and improved on the basis of additional scientific knowledge developed by research during this period and by continuous safety evaluations of the project in the construction process. It may also be possible to utilize knowledge derived from the operating experience of other reactors—as is anticipated in the instant case (R. 705-706; see R. 669). At the construction permit stage, as Regulation 50.35 provides, the Commission necessarily reviews only a design concept and an approximation of the intended result (“a facility of the general type proposed”), whereas before licensing operation it reviews a definitive “final design.”

The facts of modern scientific and technological progress also require that a definitive safety evaluation be postponed until the completion of construction and final testing. When a provisional construction permit is issued for a developmental reactor, the most that the Commission can do is to make a finding of reasonable assurance that a reactor of that type can be safely constructed and operated at the proposed site.¹³ “Reasonable assurance,” as used in this

¹³ As the Commission noted in its opinion (R. 649), the technology of certain small research reactors is so well developed (they are “virtually production line items”) that applicants have been able to supply complete hazards information in advance and the Commission issued them non-provisional permits, containing a finding as to the safety of the particular design, “the reactor,” not “the general type.” See e.g., *American Radiator and Standard Sanitary Corp.*, CPRR-50, 25 Fed. Reg. 1968. The Commission has recognized that such advance evaluation is the “ideal situation” but that it is not now possible for

context, is not speculation; it represents a substantial degree of certainty in a field which, by its very nature, is fraught with uncertainties. When the Commission makes a finding of reasonable assurance that a reactor of the particular type can be safely constructed and operated, it is in effect saying that, on the basis of the scientific and technological information then available, it appears reasonably likely that the technical problems that must be resolved before operating safety is assured will be resolved by the time construction is completed. As the Commission here pointed out (R. 672-673, emphasis in original), the "state of human knowledge at the time the report [of the Commission's Advisory Committee on Reactor Safeguards on the PRDC reactor] was prepared * * * permits the conclusion that going forward with the construction phase of this project would, by the very nature of the information developed in the course of evolving design, help to remove doubt concerning safety and would tend to provide an increasingly firm foundation for the reasonable assurance required by the statute that the project could be operated without undue risk to public health and safety." See also the testimony of Professor Bethe, quoted in the Commission's opinion (R. 673-674). Only when a reactor is completed, can the latest scientific and engineering knowledge be brought to

any of the power reactors or for many of the other types. See *infra*, p. 64. This may be feasible when, eventually, power reactors are licensed as commercial facilities (Section 103), rather than as research and development projects (Section 104(b)).

bear upon the determination of the ultimate operating safety of the actual reactor that has been built. At that point the Commission will be in a much better position to evaluate the safety of a reactor than before construction has begun. Thus, the public is fully protected by postponing the final judgment upon safety, and development goes forward on the basis of reasonable assurance from the knowledge then available that particular problems can be solved during the development period, even though the precise form of the solutions cannot be foretold.

The process of testing and verifying design and operating techniques during construction, which involves "a sort of combined construction and research and development and necessary dovetailing of these things," is thus both basic to technological advances and also necessary for ultimate safety of operation (R. 73-74, 676). Maximum safety is provided, first, by the initial determinations made before construction under Regulation 50.35, which go far, at a time when complete safety specifications cannot be fixed in advance, to assure that the reactor being built will prove to be safe and that the Commission will be able to authorize its operation. Safety is then assured by the stringent scrutiny of the final design prior to actual licensing of its operation. At both construction and operating license stages, a public hearing is held at which "[t]here can be no doubt that public safety is the first, last, and a permanent consideration." (R. 646-647.)

C. THE ACT AUTHORIZES REGULATION 50.35 AND THE PRACTICE OF GRANTING PROVISIONAL CONSTRUCTION PERMITS UPON FINDING REASONABLE ASSURANCE THAT A REACTOR OF THE GENERAL TYPE PROPOSED CAN BE BUILT AND OPERATED SAFELY

1. *Regulation 50.35 conforms to the two-step procedure authorized by Section 185 of the Act.*— Nothing in the Atomic Energy Act of 1954 supports the court of appeals' ruling that the Commission "must" make the same safety findings "when it authorizes construction" as "when it authorizes operation" (R. 957).¹⁴ On the contrary, the Act fully supports the distinction drawn in the Commission's regulations and followed in the instant case.

¹⁴ Although respondent unions contend (Br. in Opp. 11) that the court of appeals did not so hold, the opinion is to the contrary. The court stated (R. 957, emphasis in original):

"Petitioners contend that 'The Act' and the regulations of the Commission * * * require, as conditions precedent to the issuance of every construction permit for an atomic energy power reactor, that *as of the time the construction permit is issued* the Commission find that (1) it has reasonable assurance that the reactor may be constructed *and operated* at the proposed site without undue risk to the health and safety of the public * * *."

"It is undisputed that the Commission must make such a finding when it authorized operation. The question is whether it must make such a finding when it authorizes construction. In our opinion it must."

Similarly, the court then construed the legislative history (see *infra*, pp. 55, 61-62) as showing that "the Act * * * require[s], as a condition to the issuance of a construction permit, a finding that the proposed facility can be operated without undue risk to the health and safety of the public" (R. 960). This is the same finding required for an operating license, so that, in the court's view, a license must be issued "when the permitted construction is carried out" (R. 960).

Section 185 expressly provides for the issuance of construction permits and operating licenses, in two steps, and it obviously contemplates different standards for each step. The only condition imposed upon the grant of a construction permit is that the application be "otherwise acceptable to the Commission." In the case of the subsequent operating license, however, four conditions specified by Section 185 must be met (in addition to the conditions in Section 104), including a finding that the facility will be operated in conformity with the applicable statutory provisions and regulations, and the "absence of any good cause being shown to the Commission why the granting of a license would not be in accordance with the provisions of this Act." The latter standards were intended to assure that the statutory criteria for safe operation would be met before an operating license is issued. The absence of specific standards governing the grant of construction permits was evidently designed to give the Commission the broadest discretion in formulating appropriate safety standards at this stage of the proceeding.

It is also apparent from Section 185 that Congress knew that all the information necessary to make the final determinations prerequisite to a license would not be available when the construction permit was issued; and obviously, whenever this was true, a final determination concerning safety could not be made. The penultimate sentence speaks of "the filing of any additional information needed to bring the original application up to date."

The distinction is borne out by Section 182(a), which, after providing that all license applications shall contain specified information, further provides that "applications for licenses to operate production or utilization facilities" shall contain such information as the Commission ~~may~~ deem necessary to enable it to find that "*the utilization or production of special nuclear material * * ** will provide adequate protection to the health and safety of the public" (emphasis added). There is no "utilization or production" of special nuclear material during the course of construction. The reference is to the findings required by Sections 103 and 104 for the licensing of the operation of power reactors. Section 182(a) thus makes it explicit that this statutory safety standard must be satisfied before a license "to operate" may be issued. Had Congress intended in Section 185 to apply the same standard to the grant of a construction permit—which under that section merely gives authority "to construct or modify" (but, by definition, not to operate)—it would have said so.

The court of appeals' requirement that definitive safety findings be made when construction is authorized would seriously delay each new major developmental project (see R. 700), would discourage reactors incorporating "major advances" (like PRDC's, R. 702-704), which are given priority under Section 104(b), and would also lead to duplication of existing designs. It would thus thwart the progressive development of atomic power that Congress endeavored to further in the 1954 Act, without providing any demon-

strable benefits in terms of protection of public health and safety.

2. *Regulation 50.35 is a valid exercise of the rule-making power.*—The Atomic Energy Act of 1954, as we have shown above, delegates to the Commission the prime responsibility for public health and safety and gives it a broad rule-making authority. The key provision is Section 161(i), which authorizes the Commission to “prescribe such regulations or orders as it may deem necessary * * * (3) to govern any activity authorized pursuant to this Act * * * in order to protect health and to minimize danger to life or property.” See also Section 161(b). Section 103, which contains the authority to issue commercial licenses, restricts their issuance to persons “who are equipped to observe and who agree to observe such safety standards to protect health and to minimize danger to life or property, *as the Commission may by rule establish*” (Section 103(b), emphasis added). The developmental licensing provisions of Section 104(b) also speak of regulations to be imposed by the Commission to permit the Commission to protect the public health and safety. Section 104(d) prohibits the issuance of “a license” which the Commission finds would be inimical to the health or safety of the public.

We submit that it is plain, therefore, that even if the Act does not foreshadow, in Sections 182 and 185, the two-step findings concerning safety, it nevertheless authorizes the Commission to establish this procedure. Any doubt about the inferences concerning safety findings to be drawn from Sections 182 and 185 must be re-

solved in a manner consistent with the rule-making authority granted by Section 161, to which a reference is implicit in Sections 103 and 104; the key licensing provisions. See pp. 37-41, *supra*.

Regulation 50.35 is a reasonable exercise of this rule-making power. It advances the development, use and control of atomic energy, as desired by Congress (Section 1(a)) and also protects the health and safety of the public. See pp. 43-48, *supra*. The only attack upon it is the assertion that the Commission will be subjected to pressure to grant an operating license in order to save the financial investment, if it permits construction to proceed with less assurance of safety than would be required for operation. But the Commission is not concerned with the financial investment made by the applicant. The applicant takes the risk of inability to demonstrate that his reactor can operate with the high degree of safety required to protect the lives and safety of the public. In the present case, for example, the PRDC reactor could not have been licensed to operate at the time the construction permit was issued. Very serious safety problems remained unanswered. It is possible that the operation of the PRDC reactor will never be permitted because the prediction of ability to build a safe reactor of this type could not be fulfilled. The Commission made it abundantly clear in this case, as in others, that the construction permit carried no commitment to issue an operating license (R. 634-635, 649-650, 676, 679-680, 712, 716, 718-720). And the final determination upon safety must, and will be made, without regard to financial gain or loss.

The Atomic Energy Act of 1954 follows the well-established pattern of regulatory legislation which "define[s] broad areas for regulation and * * * establish[es] standards for judgment adequately related in their application to the problems to be solved" (*National Broadcasting Co. v. United States*, 319 U.S. 190, 220). Under such a statute, the agency's action must be sustained as long as it acts "within the statutory bounds of [its] authority, and * * * its choice among possible alternative standards adapted to the statutory end is one which a rational person could have made" (*Federal Security Administrator v. Quaker Oats Co.*, 318 U.S. 218, 233).¹⁵ Deference is particularly due to an agency's judgment where it represents the "contemporaneous construction of a statute by the men charged with responsibility of setting its machinery in motion, of making the parts work efficiently and smoothly while they are yet un-

¹⁵ This rule, of course, fully applies to regulation involving the public health and safety. See, e.g., the leading case of *Jacobson v. Massachusetts*, 197 U.S. 11, 25-38, which upheld compulsory vaccination as a valid exercise of the state police power. Recent application of this principle is illustrated by a line of decisions in the state courts, which have uniformly held that under general authority to "provide," "promote," or "protect" the "public health," municipalities could lawfully decide to add fluorides to water supplies in order to prevent dental caries, despite the objection that fluorides were dangerous to health. This Court has consistently denied review. E.g., *DeAryan v. Butler*, 119 Cal. App. 2d 674, 260 P. 2d 98, certiorari denied, 347 U.S. 1012; *Chapman v. Shreveport*, 225 La. 859, 74 So. 2d 142, appeal dismissed, 348 U.S. 892; *Kraus v. Cleveland*, 163 Ohio St. 559, 127 N.E. 2d 609, appeal dismissed, 351 U.S. 935. See Annotation, 43 A.L.R. 2d 453.

tried and new." *Norwegian Nitrogen Products Co. v. United States*, 288 U.S. 294, 315; *United States v. American Trucking Association*, 310 U.S. 534, 549; *Federal Housing Administration v. The Darlington, Inc.*, 358 U.S. 84, 90.

3. *The legislative history of the 1954 Act supports Regulation 50.35 and confirms the view that definitive safety findings are not required for the issuance of a construction permit.*—Under the view of the court of appeals that definitive safety findings are required for the issuance of a construction permit, it would follow, as the court stated (R. 960), that the Act "require[s] the issuance of a license when the permitted construction is carried out." The legislative history shows, however, that Congress rejected the latter requirement and, by necessary implication, recognized that, in the development of its reactor licensing program, the Commission might adopt the policy of deferring its definitive safety finding until it passes upon the operating license.

Section 185 imposes, as one of the conditions for the grant of an operating license, "the absence of any good cause being shown to the Commission why the granting of a license would not be in accordance with the provisions of this Act." The provision reserves to the Commission power to deny a license even though construction was carried out in accordance with the permit. This was a deliberate departure from the Communications Act of 1934, under which all definitive decisions with respect to the application

must be made when the agency issues a construction permit.¹⁶ Certain industry spokesmen protested the "good cause" provision of Section 185 and vainly sought its deletion, urging that all "fundamental" determinations should precede construction, and that issuance of a license should be assured when construction is completed. Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., pp. 113, 117-119, 226-227, 417, 2 Leg. Hist. 1747, 1751-1753, 1860-1861, 2051. They recognized that "the terms of the construction-permit section would need a little amendment" to give this objective a specific statutory basis. Hearings, *id.*, p. 119, 2 Leg. Hist. 1753. Congress, however, rejected the proposal, and instead required a showing, prior to the grant of an operating license, of the absence of

¹⁶ Compare the "good cause" provision of Section 185 with Section 319(c) of the Communications Act, 47 U.S.C. 319(c), which requires issuance of an operating license to the holder of a construction permit unless a "cause or circumstance arising or first coming to the knowledge of the Commission since the granting of the permit would * * * make the operation of such station against the public interest." Under that provision, an application for a permit is "in substance" an application for an operating license. *Ashbacker Radio Co. v. Federal Communications Commission*, 326 U.S. 327, 328 n. 1. Since the Communications Act was clearly the point of departure for the drafting of Section 185 (see Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., pp. 117-118, 2 Leg. Hist. 1751-1752; Marks & Trowbridge, *Framework for Atomic Industry*, p. 76 (1955); Green *The Law of Reactor Safety*, 12 Vanderbilt L. Rev. 115, 122ff), the different language used in the Atomic Energy Act shows the intent to authorize different standards for reactor construction permits and operating licenses.

"good cause" why the license should not issue—a standard that plainly embraces the statutory concept of adequate protection to the public health and safety. The Act thus contemplates some further safety determination before an operating license is issued; therefore it cannot be read to compel a definitive safety finding prior thereto, when the construction permit is granted.

When they are taken in their context, there is nothing contrary to our conclusion in the two items of legislative history invoked by the court of appeals as the basis for its decision.

(a) The principal item is a colloquy between Senators Humphrey and Hickenlooper, during which Senator Humphrey withdrew a proposed amendment of Section 185, which would have required that "no construction permits shall be issued by the Commission until after the completion of the procedures established by section 182 for the consideration of applications for licenses under this act." He did so upon being assured that "the revised sections on judicial review and on hearings and the revised section 182 on license application all apply directly to construction permits." R. 958-959; 100 Cong. Rec. 11566, 3 Leg. Hist. 3759. However, the context of this discussion, like the remainder of the debate in Congress over these sections, shows that it had nothing to do with the provision of Section 182(a) requiring a safety finding for operating licenses.

The colloquy was part of a protracted debate over the future economic pattern of the atomic industry,

involving such questions as the extent of participation by the federal government in atomic energy development, the role of local public bodies and cooperatives, the preferences to be given such bodies in licensing, the application of antitrust law and policy, and problems of rate regulation. The irrelevance of these economic issues to the safety provisions was shown in the dissent to the Joint Committee Report on the bill, which charged, *inter alia*, that the bill would turn "this greatest energy resource over to private power monopoly under licenses *unconditioned except for the requirements of national security and public health and safety*." S. Rept. 1699, 83d Cong., 2d Sess., p. 121, 1 Leg. Hist. 869; H. Rept. 2181, 83d Cong., 2d Sess., p. 121, 1 Leg. Hist. 1117. [Emphasis added.] The provisions of the Act which dealt with public health and safety were never the subject of dispute or extensive discussion during Congressional consideration of the 1954 Act.¹⁷

During the discussion of these economic issues, opponents of the draft bill (including Senator Humphrey) urged a group of amendments, including the foregoing proposed amendment to Section 185 impos-

¹⁷ The safety standard for operating licenses in Section 182(a) remained unchanged throughout the legislative consideration of the 1954 Act and was not the subject of debate. Compare Sections 182 and 189 in the bill reported to the floor (S. 3690, H.R. 9757, 83d Cong., 2d Sess., 1 Leg. Hist. 729-731, 735, 977-979, 983) with the bill as enacted. The present subsections 182 (c), (d) were originally numbered 182 (b), (c), until a 1957 amendment, 71 Stat. 576.

ing the licensing procedures of Section 182 upon the construction permit procedures in Section 185.¹⁸ On the Senate floor, the opposition achieved specific revisions in the bill, now contained in Sections 182 (c) and (d) and 189, which require that notice of hearing on applications for construction permits be given to municipalities, public bodies and cooperatives, provide them with the right to judicial review in such proceedings, and guarantee them certain preferences in licensing. Senator Humphrey's objective, as explicitly stated in the quoted colloquy, was to insure that the "*revised*" Sections 182 and 189—*i.e.*, these procedures and economic objectives (see n. 17)—should be applicable to construction permits.

The same point was explicitly made by the original proponent of the amendment to Section 185 in the House, Representative Holifield, who expressly stated that the amendment "follows through" on the other proposed amendments, requiring notice to municipalities, public bodies and cooperatives, public hearings, and preferences. These "procedures" were to be made applicable to construction permits. 100 Cong. Rec. 10397, 10398, 3 Leg. Hist. 2848, 2849; S. Rept.

¹⁸ For the proposed amendments, see the dissent to Joint Committee Report on the bill, S. Rept. 1699, 83d Cong., 2d Sess., pp. 122-123, 1 Leg. Hist. 870-871; H. Rept. 2181, 83d Cong., 2d Sess., pp. 122-123, 1 Leg. Hist. 1118-1119; 100 Cong. Rec. 10397-10398, 3 Leg. Hist. 2848-2849 (proposed in House); 3 Leg. Hist. x-xi (proposed in Senate).

1699, 83d Cong., 2d Sess., p. 123, 1 Leg. Hist. 871.¹⁹ For a similar comment on the Senate floor, see 100 Cong. Rec. 11157; 3 Leg. Hist. 3528. And in the colloquy partially quoted by the court of appeals, and thereafter, Senator Humphrey himself emphasized the proposed amendment's effect in assuring notice and preferences. 100 Cong. Rec. ~~11154~~, 11754, 3 Leg. Hist. 3759, 3877.²⁰

In short, Senator Humphrey's proposed amendment to Section 185 was designed solely to insure that the notice, hearing and appellate procedures theretofore applicable to the grant of operating licenses would be extended to construction permit proceedings. The revisions in the Act that caused him to withdraw his amendment were designed to, and did, accomplish only those procedural changes (as well as changes in the preferences given to certain municipal and public bodies). They did not purport

¹⁹ In the dissent from the Joint Committee report on the draft bill, Representatives Price and Hollifield had urged that issuance of construction permits under Section 185 "should be specifically subject to the same *procedural safeguards*, assuring interested parties full opportunity for notice, hearing, and appeal before issuance, as are provided in connection with the issuance of licenses under section 182." S. Rept. 1699, 83d Cong., 2d Sess., p. 123, 1 Leg. Hist. 871; H. Rept. 2181, 83d Cong., 2d Sess., p. 123, 1 Leg. Hist. 1119 [emphasis added].

²⁰ In this context, Senator Humphrey's reference to "pressure" for issuance of an operating license after construction (quoted R. 958-959) related to possible foreclosing of the choice of licensee unless notice, hearing, preference and appeal were available at the construction permit stage.

to, and did not, change the statutory provisions governing the health and safety findings required for construction permits—provisions which, as we have previously shown, fully justify the Commission's grant of provisional construction permits upon findings of reasonable assurance that the proposed type of reactor can be constructed and operated consistent with the public health and safety. Read in context, the statement by Senator Humphrey, which the court below stressed (R. 959), that "under the terms of the bill, as amended, the construction permit is equivalent to a license," meant only that it was "equivalent to a license" in terms of the procedures to be followed in its issuance. His mind was not directed to matters of safety and his remarks cannot fairly be construed as suggesting that the health and safety findings required for operating licenses by Section 182 were being made applicable to the grant of construction permits under Section 185.

(b) The court also relied (R. 960) on the statement in the Joint Atomic Energy Committee report on the bill that Section 185 "requires the issuance of a license if the construction is carried out in accordance with the terms of the construction permit." But, as we have shown (*supra*, pp. 37, 50), this is only one of the conditions prescribed in Section 185 for the granting of an operating license, and Congress rejected a proposal for routine issuance of operating licenses whenever construction is carried out in accordance with the permit (see *supra*, pp. 55-57). Other conditions of Section 185 clearly "require"

the Commission also to make other findings before issuing an operating license, including a finding that the facility will operate safely "in conformity with" the statutory provisions and regulations and that there is not countervailing "good cause shown." Moreover, one of the terms of every construction permit for a reactor, including this one, which must be satisfied before an operating license is granted, is that the Commission be enabled to find that the reactor is built in such a way that its operation will not endanger "the health and safety of the public" (R. 718).

4. *The acquiescence of Congress confirms Regulation 50.35 and the Commission's practice thereunder.*—Any doubt concerning the correctness of our interpretation of the statute should be removed by the Commission's frequent reports to the Joint Congressional Committee on Atomic Energy and the Committee's apparent acquiescence in the practice of issuing provisional construction permits without making definitive safety findings. The Joint Committee has a special relationship to the Commission. It exercises jurisdiction over all bills dealing with the atomic energy program. The Atomic Energy Act further requires the Commission to "keep the Joint Committee fully and currently informed with respect to all of the Commission's activities" and explicitly directs the Joint Committee to "make continuing studies of the activities of the Atomic Energy Commission and of problems relating to the development, use, and control of atomic energy," and to conduct hearings at the start of each

Congressional session on the "development, growth, and state of the atomic energy industry." Section 202, *infra*, pp. 129-130.²¹ The Commission thus keeps "on close terms with its committees, reporting to the Congress, airing its problems before them, looking to Congress for guidance and directions" (*Panama Canal Co. v. Grace Line, Inc.*, 356 U.S. 309, 318-319).

Pursuant to these statutory provisions, the Commission has repeatedly advised the Congress of the practice of issuing provisional construction permits, and the reasons behind it. In 1956, before the Commission's regulations were promulgated, the Director of the Division of Civilian Application (now Director, Division of Licensing and Regulation) described this practice as follows:

What we have done is to set up a procedure under which applicants can make their preliminary submissions to the Commission and then we would, so to speak, work along with them as fast as we are satisfied that the general design concept and the location of the facility

²¹ Congressional action up to December 1959 is compiled in Joint Committee on Atomic Energy, Atomic Energy Legislation through 86th Congress, 1st Session (Joint Committee Print, 1960), pp. 81-141, 195-205. In addition to statutory hearings and other communications, the Act provides for a general annual report of the Commission's activities, and annual report on the operation of indemnification of liability for nuclear incidents, and on any such incidents (Sections 170(i), 251, 42 U.S.C. 2210(i), 2016) and that certain decisions of the Commission must sit before the Committee for specified periods before they may become effective. Sections 51, 58, 61, 123 (c), (d), 42 U.S.C. 2071, 2078, 2091, 2153 (c), (d).

appear to be all right. We would go ahead and issue a construction permit as the statute permits, which would have to be conditional, of course, conditioned upon their satisfying the various hazards problems that they will have to deal with. * * * [I]t is pretty clear that all of those matters will not finally be resolved until about the time the reactor is going into operation, because their designs will change, and they will run tests.

(R. 652-653); Hearings on Development, Growth, and State of the Atomic Energy Industry before the Joint Committee on Atomic Energy (1956), 84th Congress, 2d Sess., p. 106). The reason for this procedure was the "substantially unique" nature of each power reactor and the technical problems which could only be resolved "on a case-by-case basis." R. 652, 654; Hearings, *id.*, pp. 106, 133.

Three months later, the Commission's General Manager told the Joint Committee that in the "ideal situation" all hazards information would be available, and evaluated, before issuance of a construction permit. "Such ideal conditions, of course, do not exist today." For that reason, to cope with "experimentation and development," the Commission's regulations allow for "provisional construction permits." The General Manager emphasized the strict safety finding required before conversion to an operating license and pointed out: "This is the type of construction permit that we will probably have to issue for all of the power demonstration reactors, and even for many of the research, testing, and medical reactors, for the

next few years." Hearings on Governmental Indemnity before the Joint Committee on Atomic Energy, 84th Cong., 2d Sess., pp. 62-65.

In 1958, the same approach was re-emphasized to the Joint Committee by the Chairman of the Commission's Advisory Committee on Reactor Safeguards. Because each large reactor is a "new type," "it is impossible to give a construction permit which then can be guaranteed to be converted into an operating license," despite the applicant's desire for such arrangement. The solution, he said, was to issue "conditional" permits and examine the developing design "step by step and keep informed each step of the way." The Vice Chairman of the Advisory Committee pointed out that safety evaluation is developed during construction and that "in general these large plants take so long a time to be constructed that much of the safety requirements are met well within the projected area of time." R. 656-658; Hearings on Development, Growth, and State of the Atomic Energy Industry before the Joint Committee on Atomic Energy (1958), 85th Cong., 2d Sess., pp. 119-121, 123; see also Hearings on Operation of AEC Indemnity Act before the Joint Committee on Atomic Energy, 85th Cong., 2d Sess., pp. 56-57.

During this same period of "subsequent and continuing action by the Congress" (*Ivanhoe Irrigation District v. McCracken*, 357 U.S. 275, 293), the Joint Committee in 1956-1957 specifically studied the Commission's reactor licensing program, including the provisional construction permit procedure. As a re-

sult, it recommended, and Congress enacted, certain changes in that program (not here involved); it did not, however, recommend any change in the Commission's practice of issuing construction permits without making definitive safety findings. 71 Stat. 576; Joint Committee on Atomic Energy, *A Study of AEC Procedures and Organization in the Licensing of Reactor Facilities*, 85th Cong., 1st Sess. (Joint Committee Print 1957).

This history of the relationship between the Commission and the Joint Committee, with full explanation of the Commission's provisional construction permit procedure, may be viewed as confirmatory of the Commission's original understanding of its powers under the Act, as affirmative Congressional acquiescence in that view, or even as Congressional "ratification of administrative construction." See *McCracken*, *supra*; *Panama Canal Co. v. Grace Line, Inc.*, 356 U.S. 309, 318-319; *Brooks v. Dewar*, 313 U.S. 354, 361. But however it is viewed, it further supports the validity of the Commission's provisional construction permit regulations.

**D. THE COMMISSION'S FINDINGS COMPLY WITH THE REGULATIONS
AND ARE SUPPORTED BY SUBSTANTIAL EVIDENCE**

Before reaffirming the construction permit, the Commission made two ultimate findings concerning safety. In Finding 35 it concluded (R. 711)

The issuance of a provisional construction permit to the Applicant will not be inimical * * * to the health and safety of the public.

This finding uses the exact words of Section 104(d) except for the substitution of "construction permit" for "license." Manifestly, it satisfies any requirement of Section 104(d) which could be thought pertinent to the issuance of a permit.

In Finding 22 the Commission concluded (R. 708):

The Commission finds reasonable assurance in the record, *for the purposes of this provisional construction permit*, that a utilization facility of the general type proposed in the PRDC Application and amendments thereto can be constructed and operated at the location without undue risk to the health and safety of the public. [Italics supplied.]

This finding not only satisfies the substance, but uses the very words of Regulation 50.35. The only divergence is the addition of the italicized phrase, "for the purposes of this provisional construction permit."

The court below thought that the use of this italicized phrase in Finding 22 and elsewhere in the Commission's Opinion, Final Decision and Order (e.g., R. 676, 710) denigrated the finding to the point where it did not meet the standard required on the other occasions and prescribed by the Act (R. 961-965). Insofar as this was simply another way of saying that the Commission did not make the findings required for the issuance of an operating license, we acknowledge that the characterization of the finding is accurate but submit that it does not invalidate the construction permit because the higher degree of assurance is not required. See pp. 49-66, *supra*. Insofar as it rules

that the findings in this case do not satisfy Regulation 50.35 or conform to the findings made in connection with other construction permits, we submit that the court's conclusion is plainly wrong.

The reference to the "purposes of this provisional construction permit" was not intended to, and did not, derogate in any way from the basic finding, reiterated several times without the reference (R. 665, 676-677, 710-711), that there was reasonable assurance that a reactor of this general type could be operated at this site without undue risk to the public health and safety. The phrase served two purposes. One was to reemphasize, and make it particularly explicit in this, the Commission's first contested reactor construction licensing case, that the grant of the construction permit was not to be taken as any indication that the safety findings then made would lead to an operating license. The italicized phrase also underscored the Commission ruling that the issuance of a provisional construction permit required no more than the finding set forth in Regulation 50.35. The following statement in the Commission's opinion (R. 676-677) shows that this interpretation of the finding is plainly correct:

It is enough for the purposes of the present proceeding (that is, for the issuance of a provisional construction permit), and for the satisfaction of the requirements of the statute and the regulations, that there be reasonable assurance that the reactor can be constructed and operated without undue risk to the health and safety of the public.

Here the phrase "for the purposes of [this] proceeding" cannot possibly be read to limit the substantive content of the finding. It obviously serves only the above-stated purposes.

Indeed, whenever the Commission finds, in issuing a construction permit, that there is a reasonable assurance that a facility of the type proposed can be operated consistent with the public health and safety, such finding necessarily is made for the purposes of the particular construction permit involved. Under the Commission's regulations (Sections 50.35, 50.40, *infra*, pp. 135-136), another safety finding relating to the particular reactor's "final design" (as distinguished from the "general type" proposed) will be required before an operating license will be issued. Here the Commission repeatedly so stated in its decision. Accordingly, the use in this case of the phrase "for the purposes of this provision" in construction permit" merely made explicit what is inherent in every grant of a construction permit—and did nothing more.

The court of appeals also held (R. 963) that "the Commission's findings regarding safety of operation are ambiguous," because of the Commission's "repeated expressions of uncertainty" on the one hand, and its "positive opinion regarding safety of operation" on the other (R. 963). This alleged ambiguity, however, involves no more than the distinction, clearly drawn in the regulations, between the two types of findings made by the Commission in granting a construction permit for a developmental reactor: a present conclusion (the "positive opinion") as to the

safety of the general type of reactor proposed, and a tentative conclusion (the alleged "expressions of uncertainty"), as to the eventual demonstration of the safety of the "final design" in the light of the applicant's research and development program. The court did not refer to Regulations 50.35 and 50.40, and we submit that when the findings are examined in the light thereof, they are not ambiguous but merely reflect the different standards there established for the grant of construction permits and operating licenses. The Commission has never contended that the PRDC reactor has been proved safe enough for a license to operate.²²

²² The court below also suggested that the Commission changed its view as to the degree of reasonable assurance it was finding in its initial and final decision. It relied, in addition to the insertion of the phrase "for the purposes of this provisional construction permit", in the final decision, on the statement in the final decision (R. 679, emphasis in original) that a different "degree of reasonable assurance" is required to satisfy the Commission "for purposes of the *provisional* construction permit" than "we would require in considering the issuance of the *operating* license." But the Commission made substantially the same statement in the initial decision (R. 934): "[W]e emphasize that the degree of certitude that satisfies us for purposes of the provisional construction permit would not be the same as we would require if we were at this moment considering the issuance of the operating license. Reasonable assurance can be a different standard for the one purpose from what it is for the other." These statements merely articulated what is implicit in Regulation 50.35, namely, that different standards will be applied in reviewing (1) the general type of facility proposed, preliminary to granting a construction permit, and (2) the actual completed reactor, prior to authorizing its operation. Indeed, it is because of these

The ultimate findings quoted above rest upon a number of subsidiary findings covering the various factors relevant to the over-all evaluation of the effect of a reactor of the type proposed upon the public health and safety. According to the Commission's opinion, there are three major problems relating to the operational safety of a fast breeder reactor (R. 669-670). First, there is the possibility that such a reactor might have autocatalytic or resonance instabilities leading to a nuclear runaway. Second, there is a possibility that a fuel meltdown resulting from the nuclear runaway or a failure of the coolant could release energies capable of breaching the various layers provided for containing radioactive fission products. Third, the leak of radioactive fission products in the event of such breaching might cause damage to members of the public. The Commission had before it a report of the Advisory Committee on Reactor Safety which concluded that as of June 6, 1956, sufficient information was not available to give assurance that the PRDC reactor could be operated at Lagoon Beach without public hazard and that it was doubtful whether sufficient experimental information would be available in time to give this assurance before construction would be completed (R. 672-673, n. 59). Under the first condition the Commission could not

different standards, based on the impossibility of making a definitive safety determination when construction is authorized, that the Commission has adopted the two-step procedure governing the granting of provisional construction permits and operating licenses. See *supra*, pp. 42-48.

properly, and would not, issue a license to operate the reactor. And an operating license could not be issued until the problems were solved.

The Commission then went on to examine the likelihood that the safety problems would be overcome. It concluded that the instabilities which could lead to a nuclear runaway were "capable of handling by design features" (R. 671), and found that the expert testimony on the safety of the PRDC design "permits the conclusion that going forward with the construction phase of this project would, by the very nature of the information developed in the course of evolving design, help to remove doubt concerning safety and would tend to provide an increasingly firm foundation for the reasonable assurance required by the statute that the project could be operated without undue risk to public health and safety" (R. 672-673). Since there is no "inherent hazard" in the construction and operation of fast neutron breeder reactors (R. 676, 703), there was reasonable assurance that the problem of instabilities would be overcome by the theoretical and experimental investigations which were being undertaken, together with the operating experience on other reactors. Summarizing its study of the safety problems, the Commission said (R. 676):

Based on this record, there is nothing in the PRDC design as presently contemplated that is known to be inherently and immediately dangerous, no insoluble problems are presently identified, and construction of a prototype is not required because of the experimental work

being done or to be done on problems affecting a fast breeder reactor of the PRDC type. However, until the questions raised by the ACRS have been answered to the satisfaction of the Commission, there will be no license to operate the PRDC reactor.

The Commission (R. 677) also made subsidiary findings concerning the location of the plant because "the question of safety obviously cannot be considered without regard to proposed location." The Commission found that the site is bordered on one side by water, that it provides an "exclusion area" on the land side with a minimum radius of 2,900 feet, and that the population distribution ranged from 175 one mile from the site, 600 two miles from the site, and 1,800 five miles from the site, up to 2,001,700 thirty miles away (R. 706-707). It pointed out that the dangers were minimized by a containment shell and that "the likelihood of any breach of the containment shell which PRDC proposes, designed as it is to contain an explosive which is equivalent to 600 pounds of TNT, a limit beyond any known accident possibility in the reactor, is extremely remote" (R. 677). The evidence also satisfied the Commission that the site "makes possible extensive safeguards against the inadvertent release of liquid contaminants" (R. 678); that it is "satisfactory from structural and underground water flow standpoints"; and that its meteorology, although complex, is not disqualifying (R. 678).

The Commission expressly reserved jurisdiction to reopen the proceeding, at any time prior to the issuance of an operating license, for further evidence and for consideration of data pertinent to safety (R. 714, 718). It also confirmed the procedure established in its initial decision "for continuing review of the safety characteristics of the PRDC fast breeder nuclear reactor plant," under which PRDC and the Commission staff were directed, and respondent unions were permitted, to file with the Commission "data pertinent to the safety in construction, design, and operating characteristics of fast breeder nuclear reactors similar or identical to PRDC project so as to permit review by the Commission * * *" (R. 711-714).²³ Finally, the Commission, although finding that no necessity had been shown for construction of a "prototype of the proposed reactor at a remote location," stated that it would reconsider that question "[i]f the program of meltdown investigation should prove inconclusive * * *" (R. 676, 705-706), *i.e.*, if it should not clearly negate a possible melting down of the nuclear fuel that could result in the release of substantial energy.

The subordinate findings as well as the Commission's ultimate conclusions on public health and safety rest upon voluminous evidence dealing with all aspects of the proposed reactor. The record includes substantial information related to PRDC's technical and financial qualifications to build and operate the fa-

²³ Such data have been filed (R. 632-634).

ility; testimony and reports on the reactor's preliminary design; discussion of fast nuclear reactors in general, including the characteristics of, and experience with, prior and proposed reactors of this type; analysis of potential hazards, and of safeguards therefor in the design of the PRDC plant; and reports on the possible effect of hypothetical incidents in a plant at Lagoon Beach, Michigan, in view of site conditions there. Since respondent unions did not challenge the evidentiary basis for the Commission's findings on public health and safety in the court below (see R. 951-953), they should not be permitted to raise the question here.

II

THE COMMISSION IS NOT REQUIRED TO MAKE AN EXPRESS FINDING SHOWING "COMPELLING REASONS" BEFORE APPROVING THE LOCATION OF A REACTOR NEAR A POPULATED AREA

The court of appeals held (R. 964) that the "Commission's safety findings are deficient in an additional respect," namely, that although "Congress intended that no reactor should, without compelling reasons, be located where it will expose so large a population to the possibility of a nuclear disaster [, i]t does not appear [that] the Commission found compelling reasons or saw that such reasons were necessary." Neither the language nor the legislative history of the Act justifies the court's "compelling reasons" standard.² Both support the Commission's settled practice

² The court of appeals' standard is not only without any basis in the statute, but also is so vague that it would be extremely difficult for the agency to administer. There is no indication

of treating the site as one of the many factors upon which its over-all ultimate judgment as to operating safety is based. Furthermore, the court's statement that the location of the PRDC reactor approximately 30 miles from Detroit will "expose" a large "population to the possibility of a nuclear disaster" has no support in, and is contradicted by, both the Commission's findings and the evidence upon which they rest.

1: The operating license for a reactor such as the PRDC plant would be issued under Section 104; the construction permit under Section 185. The only statutory test concerning safety which Congress established as prerequisite to the issuance of even an operating license is a general finding of adequate protection to the health and safety of the public. Thus, Section 104(d) provides:

In any event, no license may be issued * * * if, in the opinion of the Commission, the issuance of a license to such person would be inimical to * * * the health or safety of the public.

And Section 182(a), dealing with the contents of an application for an operating license, requires, *inter alia*:

Such * * * information as the Commission may * * * deem necessary in order to enable it to find that the utilization or production of special

what population would be deemed "so large" as to make the principle operative, or what reasons—of technology, economics or national security—might be considered "compelling." Furthermore, such an unclear standard will inevitably engender further controversy over the location of future large-scale power reactors.

nuclear material * * * will provide adequate protection to the health and safety of the public.

The statutory finding requires the evaluation of many factors. They include (1) the degree of probability as to each conceivable accident in the operation of the reactor; (2) the degree of probability, if any, that radioactive materials will escape each of the successive barriers if an accident occurs; (3) the volume and lifetime of any radioactive materials which could conceivably escape; (4) the direction and distances which they might travel; (5) the character and amount of harm which they could do; (6) the gains from the proposed method of construction and operation; (7) the advantages of the location; and (8) the number of the people and value of the property which could conceivably be affected. The evaluation of each of these factors and the balancing of advantages against disadvantages is the task of the fact-finder. Assuming, *arguendo* that it would be proper for a court to reverse the Commission if it failed to consider a relevant factor such as the nearness of a population center, the weight to be given that factor is for the Commission to determine in making the ultimate finding required by the statute. The Commission's finding is final unless it is arbitrary or capricious. *Interstate Commerce Commission v. Parker*, 326 U.S. 60; *United States v. Detroit & Cleveland Navigation Co.*, 326 U.S. 236, 241; *United States v. Storer Broadcasting Co.*, 351 U.S. 192, 203. The findings are not challenged here.

The error of the majority of the court of appeals lay in requiring a special subordinate finding of "compelling reasons" for locating a power reactor in a populated area. The short answer is that the statute requires none. Nor does the statute commit questions concerning plant location to the courts.

On the contrary the statute explicitly delegates to the Commission the responsibility for plant location. Section 161(i)(3) authorizes the Commission—

to prescribe such regulations or orders as it may deem necessary * * * to govern any activity authorized pursuant to this Act, including standards and restrictions governing the * * * location * * * of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property.

Section 182(a) lists "the place of use" as one of the items of information which must be submitted with an application in order that the Commission may determine whether there will be "adequate protection" for the public health and safety.

Pursuant to these provisions the Commission issued Regulation 50.34, which specifically requires description of the site and surrounding uses, sources of water supplies and public utilities, and pertinent meteorological, hydrological, geological and seismological data. Certain adverse site characteristics, like earthquake experience, may indicate a possible source of accidents. In addition, the effect of an incident which released fission products would depend upon

conditions at the site—particularly, meteorology and population density (R. 678, 877-878, 882, 890).

In the present case the Commission gave careful attention to the proposed location. It noted its geology, hydrology and meteorology as then ascertained and observed that further information was being developed (R. 678). Both the Initial and Final Decision explicitly take account of the density of the surrounding population (R. 614; 677-678). Both observed that "the question of safety obviously cannot be considered without regard to proposed location" (R. 677; compare R. 614), and in the Final Decision the Commission found (R. 710-711):

There is reasonable assurance that the proposed site is generally suitable for a reactor of the type and size described in the Application, if the reactor is otherwise shown to be capable of operation without undue risk to the public health and safety, including demonstrations of stability and adequate containment. Adequate investigations are under way to establish the characteristics of the proposed site, including all relevant aspects with respect thereto.

The Commission's ultimate finding upon safety also took account of the location. It found (R. 708)

reasonable assurance * * * that a utilization facility of the general type proposed in the PRDC Application and amendments thereto can be constructed and operated *at the location* without undue risk to the health and safety of the public. [Emphasis added.]

Respondents do not attack these findings and, in any event, there is substantial evidence to support them. Professor Hans Bethe (R. 779) stated that

a fast breeder reactor of the general type proposed by PRDC can be constructed and operated in a populated community without undue risk to the public, and that it can be demonstrated, when such reactor has been built, that its operation is safe.

Another expert, Professor Harvey Brooks of Harvard, a member of the Commission's Advisory Committee on Reactor Safeguards, testified (R. 674-675):

* * * I believe that in all probability a fast breeder reactor of the PRDC design can be operated in a populous location such as the proposed Lagoona Beach site without undue hazard to the health and safety of the public.

See also the statements to the same effect of Dr. Hilberry, Deputy Director of the Argonne Laboratory (R. 818), Mr. Davis, Director of the Commission's Division of Reactor Development (R. 853-854), and Professor Benedict of Massachusetts Institute of Technology (R. 674). Behind these general statements by expert witnesses lies a mass of technical data.

2. The court of appeals' statement that the proposed location "will expose so large a population to the possibility of a nuclear disaster" (R. 964) not only usurps the Commission's function of finding and evaluating the facts but it flies in the face of the undisputed testimony. This would be error in any proceeding to

review the order of an administrative agency. *Federal Trade Commission v. Algoma Lumber Co.*, 291 U.S. 67, 73. The error is especially serious where judges not trained in complicated scientific and technical matters undertake to substitute their conclusions for the findings of the expert body established by Congress. *Secretary of Agriculture v. Central Roig Refining Co.*, 338 U.S. 604, 614; *Federal Trade Commission v. Sewell*, 353 U.S. 969.

It is obvious, of course, that when all other conditions are the same, a power reactor located near a city creates a greater risk of harm than the identical plant located in the wilderness. If there were no offsetting advantages, it might be desirable to put the reactor in the wilderness even though the chance that harm would occur was infinitesimally small. But in the present case there were offsetting advantages in the site for the Commission to consider—advantages which, in view of the high degree of engineering safeguards that this reactor will have (see *supra*, pp. 13, 16), justified the Commission's approval of the reactor at this location.

While the Commission did not specifically discuss these offsetting advantages, they were the implicit framework within which its decision was made. For Congress made the determination, by deciding that atomic power should be developed by and as part of American industry, that there were significant benefits to the country in permitting the Commission to approve reactor locations near metropolitan areas. See *supra*, pp. 35-36, *infra*, pp. 85-87. In the present case,

the advantages of a location within reasonable distance of Detroit are substantial.

(a) The very purpose of the proposed reactor was to develop a nuclear power plant capable of economically generating electric energy as a part of a public utility system. The Commission and PRDC were not engaged in pure research but in the economical development of operating generating stations using atomic energy. In contrast, the Commission's fast breeder reactors EBR-I and EBR-II (see n. 10, *supra*, p. 19) are flexible experimental facilities which will supply a wealth of scientific data concerning reactor operation. The PRDC reactor is not experimental in this sense, although it has certain novel features. However, it is primarily a prototype for central power stations to be based on proven technology before it is licensed to operate. It is intended to demonstrate the reliability and economic utility of an atomic power plant under normal operating conditions, as a large baseload plant in a power grid with varying demands, and to furnish information on the economics and maintenance of such a plant in routine use (R. 809-815, 839-841). Much of the PRDC plant's value for this essential research and development would be lost by locating it in the wilderness.

(b) The reactor will supply electric energy in the Detroit area if an operating license can be issued safely.

(c) Pursuant to a well-defined Congressional policy, adopted after careful deliberation, the Commission seeks to foster progress in atomic power development.

by encouraging the widespread participation of public utilities and industrial concerns in the development and use of atomic energy. This was one of the basic purposes of the Atomic Energy Act of 1954.²⁵ Effective participation by utilities, however, may be impossible if large power reactors must be located in remote areas of the country and cannot be placed in the utilities' service areas or within a reasonable distance, to provide feasible service to the utilities' metropolitan and industrial consumers.

We do not overlook the fact that although these considerations may be reasons for licensing a reactor in a populated area, the proximity of the population demands a higher degree of safety. The Commission acknowledged this, and took it into account in the findings. See pp. 73, 79-80, *supra*. The statute requires no more.

3. The Commission's procedure in this case followed the same course as all other applications to license the construction or operation of a reactor. Construction permits have not been issued by the Commission for developmental power reactors without full consideration of all the pertinent criteria of safety of operation at the proposed site, but the Commission has never made a special finding that there were "compelling reasons" for locating the reactor site not far from a

²⁵ See Sections 1(b), 3 (a), (d), 182 (c), (d), 42 U.S.C. 2011, 2013 (a), (d), 2232 (c), (d). H. Doc. 328, 83d Cong., 2d Sess., pp. 6-7, 1 Leg. Hist. 50-51; S. Rept. 1699, 83d Cong., 2d Sess., pp. 3, 9, 1 Leg. Hist. 751, 757; H. Rept. 2181, 83d Cong., 2d Sess., pp. 3, 9, 1 Leg. Hist. 999, 1005; pp. 35-36, *supra*.

populated area.²⁶ In determining whether a particular reactor should be approved, the Commission considers and evaluates all the factors, including location, that bear upon operating safety. A prime consideration, of course, is the facility itself, starting with the reactor type, power level, control and safety devices, shielding and containment—in short, all aspects of design features and operating procedures pertinent to the stability of the reactor, and the avoidance of hazards. The Commission, even if satisfied that the design of the reactor satisfies safety standards, may nevertheless find that site characteristics are so unfavorable as to require relocation or abandonment of projects, as has occurred on several occasions; population densities immediately adjacent are significant in this determination.²⁷ However, location 30 miles from a large center

²⁶ A listing of power reactors now operating or being constructed by licensees and the Commission, and distances from nearby population centers, is set out in Appendix B, *infra*, pp. 137-139. The Commission's criteria for power reactor sites are exemplified by those cases and has been often discussed at Congressional hearings, e.g., the material cited, *infra*, n. 27, and pp. 85-89. A proposed formal rule, embodying the Commission's criteria and *inter alia* pointing out the relation of population density outside an "exclusion area" to other factors, was published in 24 F.R. 4184. Comments have been received, and a revised rule is now in preparation to be published for public comment.

²⁷ See, e.g., *City of Piqua, Ohio*, A.E.C. Docket No. PP-2 (adjacent population density); Point LOMA Process Heat Reactor, Report of Advisory Committee on Reactor Safeguards, March 14, 1960 (AEC Public Document Room) (unfavorable meteorology, adjacent population density, other local uses). Cf. Hearings on Indemnity and Reactor Safety before the Joint Committee on Atomic Energy, 86th Cong., 2d Sess., pp. 247-250.

of population has never been considered disqualifying *per se*, although it would be particularly pertinent to appraisal of the consequences of an incident causing a substantial release of fission products under extremely adverse meteorological conditions (R. 877). In view of the location, the Commission may require certain additional design features or impose conditions upon operation—as, indeed, it may do in this case before authorizing operation. Even if the Commission is satisfied that the reactor will operate safely, its location near a populated area demands that the reactor be enclosed in a steel vapor shell designed to contain all fission products that could be released by the maximum credible accident (R. 743, 882). Cf. Hearings before the Joint Committee on Atomic Energy on Indemnity and Reactor Safety, 86th Cong., 2d Sess., pp. 200–204; on Governmental Indemnity and Reactor Safety, 85th Cong., 1st Sess., pp. 54–55 (n. 30, *infra*). Such a shell will, of course, be required for the PRDC reactor (R. 666–667).

4. The Commission's policy on reactor location is explicitly validated by the legislative history of the Act. In the first place, Congress contemplated that the safety regulation it was committing to the Commission's discretion included supervision of the location of reactors. Review of such sites was mentioned as an important aspect of issuing construction permits during the 1954 hearings. Hearings on S. 3323 and H.R. 8862 before the Joint Committee on Atomic Energy, 83d Cong., 2d Sess., p. 118, 2 Leg. Hist. 1752. Moreover, Congress understood that, under the

licensing program, many power reactors (like new conventional generating facilities) would be constructed and operated "near but not in" the power-consuming "metropolitan and industrial centers." Hearings, *supra*, p. 582, 2 Leg. Hist. 2220. The use of such locations was implicit in the President's desire to have the industry develop "in a manner as nearly normal as possible, with careful regulation to protect the national security and the public health and safety" (H. Doc. 328, 83d Cong., 2d Sess., pp. 6-7, 1 Leg. Hist. 50-51). Location near industrial areas is necessary to carry out the clear legislative intent to chart a course for atomic power reactors as "an integral part of the electric-generating activities of the country" (Hearing, *supra*, p. 582, 1 Leg. Hist. 2220).

Congress also understood, and anticipated, that reactors would be located near metropolitan centers during the developmental stage of atomic power. There were repeated references to the Commission's Shippingport Pressurized Water Reactor, then being constructed about 30 miles from the center of Pittsburgh—"the Nation's first large-scale atomic-power reactor, which will generate 60,000 kilowatts of electricity—an amount sufficient to furnish light and power for a sizable city." S. Rep. 1699, 83d Cong., 2d Sess., p. 3, 1 Leg. Hist. 751; H. Rep. 2181, 83d Cong., 2d Sess., p. 3, 1 Leg. Hist. 999. And Senator Kennedy testified in favor of the location of "pilot plant activity" and "experimental plants" in New England, where eventual commercial feasibility could

be anticipated. Hearings, *supra*, pp. 774-780, 2 Leg. Hist. 2412-2418. See, also, as to New York State, 100 Cong. Rec. 10910, 3 Leg. Hist. 3461. Congress was confident that, by giving the Commission broad discretion to formulate a safety program, "greater private participation in power development need not bring with it attendant hazards to the health and safety of the American people." S. Rep. 1699, 83d Cong., 2d Sess., p. 3, 1 Leg. Hist. 751; H. Rep. 2181, 83d Cong., 2d Sess., p. 3, 1 Leg. Hist. 999.

There is nothing to the contrary in the 1957 report to the Joint Committee on Atomic Energy, mentioned by the majority in the court of appeals (R. 964). The report appraised the most extreme consequences of hypothetical incidents in a hypothetical nuclear power plant, prepared as a background for consideration of a bill to provide Government indemnity to licensees and contractors, which became Section 170 of the Act, *infra*, pp. 117-123. The report analyzed generally the possibility of such hypothetical incidents and discussed the principles underlying the Commission's reactor safety program and the past record. It concluded that the possibility of injury to members of the public, or of a major incident, *i.e.*, one in which substantial quantities of fis-

²⁸ High cost power areas, like New England, are entitled to preferred consideration in the licensing of commercial power reactors. In such licensing, the Commission shall also give prior notice to municipalities, public, cooperative and privately-owned utilities "within transmission distance". See 182 (c), (d), 42 U.S.C. 2232 (c), (d).

sion products were released, was "exceedingly small" (R. 349, 354, 879-886).²⁹ These findings proceeded upon the assumption that a site about 30 miles from a major city is a "typical location" for a power reactor. The assumption was based upon the commercial and government projects then proposed (R. 888, 914-917). The description is especially significant, for Congress expressly relied upon the report in enacting the indemnity legislation; and the legislation itself was designed to encourage further private participation in atomic power at such "typical" sites by providing governmental indemnity against liability. S. Rep. 296, 85th Cong., 1st Sess., pp. 1-3, 5-6, 31-34; H.

²⁹ In placing reliance upon statements in this study, the court below may have been under a misapprehension of what hazards are presented by the operation of a power reactor. See *supra*, pp. 15-19.

Moreover, as the 1957 report states, it was "not in any sense a prediction of any future condition" and safety of a particular reactor or type "depends on the combination of many complex and inter-related factors" (R. 351, 880). In several obvious respects, the extreme hypothetical accident posited by the 1957 report cannot be applied to PRDC. The hypothetical plant had a capacity of 500,000 thermal kilowatts and a fuel reloading cycle of 180 days (R. 887), and therefore would contain much more fission products than PRDC with its 300,000 thermal kilowatts and more frequent reloading (R. 740-741). The extreme hypothetical accident also assumed a release to the atmosphere of 50% of all fission products in the reactor under adverse meteorological conditions (R. 893, 898-900), while the Commission concluded that the steel containment shell around the PRDC reactor would be shown to be able to contain the consequences of any credible accident, and that no significant quantities of fission products would be released into the atmosphere (R. 677, 706, 710).

Rep. 435, 85th Cong., 1st Sess., pp. 1-3, 5-6, 31-34. The legislative history of the 1957 amendment, as well as the subsequent discussion before Congress of the indemnity program, therefore, demonstrates a clear Congressional understanding that sites near populated areas would be utilized and that population density is but one of the "combination of features"³⁰

³⁰ The Director of the Commission's Division of Licensing and Regulation, discussing site criteria at a 1958 hearing, pointed out that "there is always a combination of features that have to be looked at. * * * what would be a reasonably safe distance for one type of reactor with one kind of containment might not be suitable for a different reactor in a different location with or without a different kind of containment. Representative HOLIFIELD. That is right." Hearings on Operation of AEC Indemnity Act before the Joint Committee on Atomic Energy, 85th Cong., 2d Sess., p. 53.

Representative Holifield had dissented a year earlier from the indemnity legislation on the ground that power reactors could be developed at "isolated locations" and there were "no compelling reasons" for the government to assume indemnification liability. H. Rep. 435, 85th Cong., 1st Sess., pp. 38, 39-40. The above quotation, and the 1957 context, shows that even this dissenting observation was not intended to imply any limitation upon the Commission's power to regulate reactor sites under the terms of the Atomic Energy Act of 1954. For other discussions of reactor sites in connection with the indemnity legislation, see Hearings before the Joint Committee on Atomic Energy on Governmental Indemnity, 84th Cong., 2d Sess., pp. 60-65, 211-215; on Governmental Indemnity and Reactor Safety, 85th Cong., 1st Sess., pp. 10-12, 26-27, 54-55, 116-121; on Operation of AEC Indemnity Act, 85th Cong., 2d Sess., 51-53, 57-58; on Indemnity and Reactor Safety, 86th Cong., 2d Sess., pp. 192-209, 225-226, 241-242. See also Section 140.12 of the Commission's regulations (10 CFR, as amended, 25 F.R. 2944), utilizing population densities to calculate the insurance required of licensees.

to be considered by the Commission in exercising its regulatory authority.

As shown above (pp. 73, 79-80), in the present case the Commission took this factor into account and gave it adequate weight in making the undisputed finding that there was reasonable assurance that the reactor could be constructed and operated "at the location without undue risk to the health and safety of the public" (R. 708).

CONCLUSION

The judgment of the court of appeals should be reversed.

Respectfully submitted.

ARCHIBALD COX,

Solicitor General.

WILLIAM H. ORRICK, Jr.,

Assistant Attorney General.

DANIEL M. FRIEDMAN,

Assistant to the Solicitor General.

MORTON HOLLANDER,

Attorney.

NEIL D. NAIDEN,

General Counsel,

COURTS OULAHAN,

Deputy General Counsel,

LIONEL KESTENBAUM,

Attorney,

Atomic Energy Commission.

FEBRUARY 1961.

APPENDIX A

STATUTE AND REGULATIONS INVOLVED

1. The Atomic Energy Act of 1954, 68 Stat. 919, as amended, 42 U.S.C. 2011 *et seq.*, provides in pertinent part:

SEC. 1. DECLARATION.—Atomic energy is capable of application for peaceful as well as military purposes. It is therefore declared to be the policy of the United States that—

a. the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security; and

b. the development, use, and control of atomic energy shall be directed so as to promote world peace, improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise.

* * * * *

SEC. 2. FINDINGS.—The Congress of the United States hereby makes the following findings concerning the development, use, and control of atomic energy:

a. The development, utilization, and control of atomic energy for military and for all other purposes are vital to the common defense and security.

b. In permitting the property of the United States to be used by others, such use must be regulated in the national interest and in order to provide for the common defense and security.

and to protect the health and safety of the public.

c. The processing and utilization of source, byproduct, and special nuclear material affect interstate and foreign commerce and must be regulated in the national interest.

d. The processing and utilization of source, byproduct, and special nuclear material must be regulated in the national interest, and in order to provide for the common defense and security and to protect the health and safety of the public.

e. Source and special nuclear material, production facilities, and utilization facilities are affected, with the public interest, and regulation by the United States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest to assure the common defense and security and to protect the health and safety of the public.

f. The necessity for protection against possible interstate damage occurring from the operation of facilities for the production or utilization of source or special nuclear material places the operation of those facilities in interstate commerce for the purposes of this Act.

g. Funds of the United States may be provided for the development and use of atomic energy under conditions which will provide for the common defense and security and promote the general welfare.

h. It is essential to the common defense and security that title to all special nuclear material be in the United States while such special nuclear material is within the United States.

i. In order to protect the public and to encourage the development of the atomic energy industry, in the interest of the general welfare and of the common defense and security, the United States may make funds available for a

portion of the damages suffered by the public from nuclear incidents, and may limit the liability of those persons liable for such losses.

SEC. 3. PURPOSE.—It is the purpose of this Act to effectuate the policies set forth above by providing for—

a. a program of conducting, assisting, and fostering research and development in order to encourage maximum scientific and industrial progress;

b. a program for the dissemination of unclassified scientific and technical information and for the control, dissemination, and declassification of Restricted Data, subject to appropriate safeguards, so as to encourage scientific and industrial progress;

c. a program for Government control of the possession, use, and production of atomic energy and special nuclear material so directed as to make the maximum contribution to the common defense and security and the national welfare;

d. a program to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public;

e. a program of international cooperation to promote the common defense and security and to make available to cooperating nations the benefits of peaceful applications of atomic energy as widely as expanding technology and considerations of the common defense and security will permit; and

f. a program of administration which will be consistent with the foregoing policies and programs, with international arrangements, and with agreements for cooperation, which will enable the Congress to be currently informed so as to take further legislative action as may be appropriate.

* * * * *

SEC. 29. ADVISORY COMMITTEE ON REACTOR SAFEGUARDS.—There is hereby established an Advisory Committee on Reactor Safeguards consisting of a maximum of fifteen members appointed by the Commission for terms of four years each. The Committee shall review safety studies and facility license applications referred to it and shall make reports thereon, shall advise the Commission with regard to the hazards of proposed or existing reactor facilities, and the adequacy of proposed reactor safety standards, and shall perform such other duties as the Commission may request. One member shall be designated by the Committee as its Chairman. The members of the Committee shall receive a per diem compensation for each day spent in meetings or conferences, or other work of the Committee, and all members shall receive their necessary traveling or other expenses while engaged in the work of the Committee. The provisions of section 163 shall be applicable to the Committee.

* * * * *

SEC. 31. RESEARCH ASSISTANCE.—

a. The Commission is directed to exercise its powers in such manner as to insure the continued conduct of research and development and training activities in the fields specified below, by private or public institutions or persons, and to assist in the acquisition of an ever-expanding fund of theoretical and practical knowledge in such fields. To this end the Commission is authorized and directed to make arrangements (including contracts, agreements, and loans) for the conduct of research and development activities relating to—

- (1) nuclear processes;
- (2) the theory and production of atomic energy, including processes, materials, and devices related to such production;

(3) utilization of special nuclear material and radioactive material for medical, biological, agricultural, health, or military purposes; and

(4) utilization of special nuclear material, atomic energy, and radioactive material and processes entailed in the utilization or production of atomic energy or such material for all other purposes, including industrial uses, the generation of usable energy, and the demonstration of the practical value of utilization or production facilities for industrial or commercial purposes; and

(5) the protection of health and the promotion of safety during research and production activities.

b. The Commission is further authorized to make grants and contributions to the cost of construction and operation of reactors and other facilities and other equipment to colleges, universities, hospitals, and eleemosynary or charitable institutions for the conduct of educational and training activities relating to the fields in subsection a.

c. The Commission may (1) make arrangements pursuant to this section, without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon certification by the Commission that such action is necessary in the interest of the common defense and security, or upon a showing by the Commission that advertising is not reasonably practicable; (2) make partial and advance payments under such arrangements; and (3) make available for use in connection therewith such of its equipment and facilities as it may deem desirable.

d. The arrangements made pursuant to this section shall contain such provisions (1) to protect health, (2) to minimize danger to life or property, and (3) to require the reporting and to permit the inspection of work per-

formed thereunder, as the Commission may determine. No such arrangement shall contain any provisions or conditions which prevent the dissemination of scientific or technical information, except to the extent such dissemination is prohibited by law.

SEC. 32. RESEARCH BY THE COMMISSION.—The Commission is authorized and directed to conduct, through its own facilities, activities and studies of the types specified in section 31.

SEC. 33. RESEARCH FOR OTHERS.—Where the Commission finds private facilities or laboratories are inadequate to the purpose, it is authorized to conduct for other persons, through its own facilities, such of those activities and studies of the types specified in section 31 as it deems appropriate to the development of atomic energy. The Commission is authorized to determine and make such charges as in its discretion may be desirable for the conduct of such activities and studies.

SEC. 41. OWNERSHIP AND OPERATION OF PRODUCTION FACILITIES.—

a. OWNERSHIP OF PRODUCTION FACILITIES.—The Commission, as agent of and on behalf of the United States, shall be the exclusive owner of all production facilities other than facilities which (1) are useful in the conduct of research and development activities in the fields specified in section 31, and do not, in the opinion of the Commission, have a potential production rate adequate to enable the user of such facilities to produce within a reasonable period of time a sufficient quantity of special nuclear material to produce an atomic weapon; or (2) are licensed by the Commission pursuant to section 103 or 104.

b. OPERATION OF THE COMMISSION'S PRODUCTION FACILITIES.—The Commission is authorized and directed to produce or to provide for the production of special nuclear material in its

own production facilities. To the extent deemed necessary, the Commission is authorized to make, or to continue in effect, contracts with persons obligating them to produce special nuclear material in facilities owned by the Commission. The Commission is also authorized to enter into research and development contracts authorizing the contractor to produce special nuclear material in facilities owned by the Commission to the extent that the production of such special nuclear material may be incident to the conduct of research and development activities under such contracts. Any contract entered into under this section shall contain provisions (1) prohibiting the contractor from subcontracting any part of the work he is obligated to perform under the contract, except as authorized by the Commission; and (2) obligating the contractor (A) to make such reports pertaining to activities under the contract to the Commission as the Commission may require, (B) to submit to inspection by employees of the Commission of all such activities; and (C) to comply with all safety and security regulations which may be prescribed by the Commission. Any contract made under the provisions of this paragraph may be made without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon certification of the Commission that such action is necessary in the interest of the common defense and security; or upon a showing by the Commission that advertising is not reasonably practicable. Partial and advance payments may be made under such contracts. The President shall determine in writing at least once each year the quantities of special nuclear material to be produced under this section and shall specify in such determination the quantities of special nuclear material to be available for distribution by the Commission pursuant to section 53 or 54.

c. OPERATION OF OTHER PRODUCTION FACILITIES.—Special nuclear material may be produced in the facilities which under this section are not required to be owned by the Commission.

SEC. 42. IRRADIATION OF MATERIALS.—The Commission and persons lawfully producing or utilizing special nuclear material are authorized to expose materials of any kind to the radiation incident to the processes of producing or utilizing special nuclear material.

SEC. 43. ACQUISITION OF PRODUCTION FACILITIES.—The Commission is authorized to purchase any interest in facilities for the production of special nuclear materials, or in real property on which such facilities are located, without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon certification by the Commission that such action is necessary in the interest of the common defense and security, or upon a showing by the Commission that advertising is not reasonably practicable. Partial and advance payments may be made under contracts for such purposes. The Commission is further authorized to requisition, condemn, or otherwise acquire any interest in such production facilities, or to condemn or otherwise acquire such real property, and just compensation shall be made therefor.

SEC. 44. DISPOSITION OF ENERGY.—If energy is produced at production facilities of the Commission or is produced in experimental utilization facilities of the Commission, such energy may be used by the Commission, or transferred to other Government agencies, or sold to publicly, cooperatively, or privately owned utilities or users at reasonable and nondiscriminatory prices. If the energy produced is electric energy, the price shall be subject to regulation by the appropriate agency having jurisdiction.

In contracting for the disposal of such energy, the Commission shall give preference and priority to public bodies and cooperatives or to privately owned utilities providing electric utility services to high cost areas not being served by public bodies or cooperatives. Nothing in this Act shall be construed to authorize the Commission to engage in the sale or distribution of energy for commercial use except such energy as may be produced by the Commission incident to the operation of research and development facilities of the Commission, or of production facilities of the Commission.

* * * * *

SEC. 51. SPECIAL NUCLEAR MATERIAL.—The Commission may determine from time to time that other material is special nuclear material in addition to that specified in the definition as special nuclear material. Before making any such determination, the Commission must find that such material is capable of releasing substantial quantities of atomic energy and must find that the determination that such material is special nuclear material is in the interest of the common defense and security, and the President must have expressly assented in writing to the determination. The Commission's determination, together with the assent of the President, shall be submitted to the Joint Committee and a period of thirty days shall elapse while Congress is in session (in computing such thirty days there shall be excluded the day on which either House is not in session because of an adjournment for more than three days) before the determination of the Commission may become effective: *Provided, however,* That the Joint Committee, after having received such determination, may by resolution in writing, waive the conditions of all or any portion of such thirty-day period.

SEC. 52. GOVERNMENT OWNERSHIP OF ALL SPECIAL NUCLEAR MATERIAL.—All rights, title,

and interest in or to any special nuclear material within or under the jurisdiction of the United States, now or hereafter produced, shall be the property of the United States and shall be administered and controlled by the Commission as agent of and on behalf of the United States by virtue of this Act. Any person owning any interest in any special nuclear material at the time when such material is hereafter determined to be a special nuclear material shall be paid just compensation therefor. Any person who lawfully produces any special nuclear material, except pursuant to a contract with the Commission under the provisions of section 31 or 41, shall be paid a fair price, determined pursuant to section 56, for producing such material.

SEC. 53. DOMESTIC DISTRIBUTION OF SPECIAL NUCLEAR MATERIAL.—

a. The Commission is authorized to issue licenses for the possession of, to make available for the period of the license, and to distribute special nuclear material within the United States to qualified applicants requesting such material—

(1) for the conduct of research and development activities of the types specified in section 31;

(2) for use in the conduct of research and development activities or in medical therapy under a license issued pursuant to section 104;

(3) for use under a license issued pursuant to section 103;

(4) for such other uses as the Commission determines to be appropriate to carry out the purposes of this Act.

b. The Commission shall establish, by rule, minimum criteria for the issuance of specific or general licenses for the distribution of special nuclear material depending upon the degree of importance to the common defense and security or to the health and safety of the public of—

(1) the physical characteristics of the special nuclear material to be distributed;

(2) the quantities of special nuclear material to be distributed; and

(3) the intended use of the special nuclear material to be distributed.

c. The Commission may make a reasonable charge, determined pursuant to this section, for the use of special nuclear material licensed and distributed under subsection 53 a. (1), (2) or (4) and shall make a reasonable charge determined pursuant to this section for the use of special nuclear material licensed and distributed under subsection 53 a. (3). The Commission shall establish criteria in writing for the determination of whether a charge will be made for the use of special nuclear material licensed and distributed under subsection 53 a. (1), (2) or (4), considering, among other things, whether the licensee is a nonprofit or eleemosynary institution and the purposes for which the special nuclear material will be used.

d. In determining the reasonable charge to be made by the Commission for the use of special nuclear material distributed to licensees of utilization or production facilities licensed pursuant to section 103 or 104, in addition to consideration of the cost thereof, the Commission shall take into consideration—

(1) the use to be made of the special nuclear material;

(2) the extent to which the use of the special nuclear material will advance the development of the peaceful uses of atomic energy;

(3) the energy value of the special nuclear material in the particular use for which the license is issued;

(4) whether the special nuclear material is to be used in facilities licensed pursuant to section 103 or 104. In this respect, the Commission shall, insofar as practicable, make uniform, nondiscriminatory charges for the use of spe-

cial nuclear material distributed to facilities licensed pursuant to section 103; and

(5) with respect to special nuclear material consumed in a facility licensed pursuant to section 103, the Commission shall make a further charge based on the cost to the Commission, as estimated by the Commission, or the average fair price paid for the production of such special nuclear material as determined by section 56, whichever is lower.

e. Each license issued pursuant to this section shall contain and be subject to the following conditions—

(1) title to all special nuclear material shall at all times be in the United States;

(2) no right to the special nuclear material shall be conferred by the license except as defined by the license;

(3) neither the license nor any right under the license shall be assigned or otherwise transferred in violation of the provisions of this Act;

(4) all special nuclear material shall be subject to the right of recapture or control reserved by section 108 and to all other provisions of this Act;

(5) no special nuclear material may be used in any utilization or production facility except in accordance with the provisions of this Act;

(6) special nuclear material shall be distributed only on terms, as may be established by rule of the Commission, such that no user will be permitted to construct an atomic weapon;

(7) special nuclear material shall be distributed only pursuant to such safety standards as may be established by rule of the Commission to protect health and to minimize danger to life or property; and

(8) except to the extent that the indemnification and limitation of liability provisions of

section 170 apply, the licensee will hold the United States and the Commission harmless from any damages resulting from the use or possession of special nuclear material by the licensee.

f. The Commission is directed to distribute within the United States sufficient special nuclear material to permit the conduct of widespread independent research and development activities to the maximum extent practicable and within the limitations set by the President pursuant to section 41. In the event that applications for special nuclear material exceed the amount available for distribution, preference shall be given to those activities which are most likely, in the opinion of the Commission, to contribute to basic research, to the development of peacetime uses of atomic energy, or to the economic and military strength of the Nation.

* * * * *

SEC. 57. PROHIBITION.—

a. It shall be unlawful for any person to—

(1) possess or transfer any special nuclear material which is the property of the United States except as authorized by the Commission pursuant to subsection 53 a.;

(2) transfer or receive any special nuclear material in interstate commerce except as authorized by the Commission pursuant to subsection 53a., or export from or import into the United States any special nuclear material; and

(3) directly or indirectly engage in the production of any special nuclear material outside of the United States except (A) under an agreement for cooperation made pursuant to section 123, or (B) upon authorization by the Commission after a determination that such activity will not be inimical to the interest of the United States.

✓ The Commission shall not distribute any special nuclear material—

(1) to any person for a use which is not under the jurisdiction of the United States except pursuant to the provisions of section 54; or

(2) to any person within the United States, if the Commission finds that the distribution of such special nuclear material to such person would be inimical to the common defense and security.

SEC. 58. REVIEW.—Before the Commission establishes any fair price or guaranteed fair price period in accordance with the provisions of section 56, or establishes any criteria for the waiver of any charge for the use of special nuclear material licensed or distributed under section 53 the proposed fair price, guaranteed fair price period, or criteria for the waiver of such charge shall be submitted to the Joint Committee, and a period of forty-five days shall elapse while Congress is in session (in computing such forty-five days there shall be excluded the days in which either House is not in session because of adjournment for more than three days): *Provided, however,* That the Joint Committee, after having received the proposed fair price, guaranteed fair price period, or criteria for the waiver of such charge, may by resolution waive the conditions of or all or any portion of such forty-five day period.

* * * * *

SEC. 61. SOURCE MATERIAL.—The Commission may determine from time to time that other material is source material in addition to those specified in the definition of source material. Before making such determination, the Commission must find that such material is essential to the production of special nuclear material and must find that the determination that such

material is source material is in the interest of the common defense and security, and the President must have expressly assented in writing to the determination. The Commission's determination, together with the assent of the President, shall be submitted to the Joint Committee and a period of thirty days shall elapse while Congress is in session (in computing such thirty days, there shall be excluded the days on which either House is not in session because of an adjournment of more than three days) before the determination of the Commission may become effective: *Provided, however,* That the Joint Committee, after having received such determination, may by resolution in writing waive the conditions of or all or any portion of such thirty-day period.

SEC. 62. LICENSE FOR TRANSFERS REQUIRED.— Unless authorized by a general or specific license issued by the Commission, which the Commission is hereby authorized to issue, no person may transfer or receive in interstate commerce, transfer, deliver, receive possession of or title to, or import into or export from the United States any source material after removal from its place of deposit in nature, except that licenses shall not be required for quantities of source material which, in the opinion of the Commission, are unimportant.

SEC. 63. DOMESTIC DISTRIBUTION OF SOURCE MATERIAL.—

a. The Commission is authorized to issue licenses for and to distribute source material within the United States to qualified applicants requesting such material—

(1) for the conduct of research and development activities of the types specified in section 31:

(2) for use in the conduct of research and development activities or in medical therapy under a license issued pursuant to section 104;

(3) for use under a license issued pursuant to section 103; or

(4) for any other use approved by the Commission as an aid to science or industry.

b. The Commission shall establish, by rule, minimum criteria for the issuance of specific or general licenses for the distribution of source material depending upon the degree of importance to the common defense and security or to the health and safety of the public of—

(1) the physical characteristics of the source material to be distributed;

(2) the quantities of source material to be distributed; and

(3) the intended use of the source material to be distributed.

c. The Commission may make a reasonable charge determined pursuant to subsection 161 m. for the source material licensed and distributed under subsection 63 a. (1), subsection 63 a. (2), or subsection 63 a. (4), and shall make a reasonable charge determined pursuant to subsection 161 m., for the source material licensed and distributed under subsection 63 a. (3). The Commission shall establish criteria in writing for the determination of whether a charge will be made for the source material licensed and distributed under subsection 63 a. (1); subsection 63 a. (2); or subsection 63 a. (4), considering, among other things, whether the licensee is a nonprofit or eleemosynary institution and the purposes for which the source material will be used.

SEC. 64. FOREIGN DISTRIBUTION OF SOURCE MATERIAL.—The Commission is authorized to cooperate with any nation by distributing source material and to distribute source material pursuant to the terms of an agreement for cooperation to which such nation is a party and which is made in accordance with section 123. The Commission is also authorized to distribute source material outside of the United States

upon a determination by the Commission that such activity will not be inimical to the interests of the United States.

SEC. 65. REPORTING.—The Commission is authorized to issue such rules, regulations or orders requiring reports of ownership, possession, extraction, refining, shipment, or other handling of source material as it may deem necessary, except that such reports shall not be required with respect to (a) any source material prior to removal from its place of deposit in nature, or (b) quantities of source material which in the opinion of the Commission are unimportant or the reporting of which will discourage independent prospecting for new deposits.

SEC. 66. ACQUISITION.—The Commission is authorized and directed, to the extent it deems necessary to effectuate the provisions of this Act—

a. to purchase, take, requisition, condemn, or otherwise acquire supplies or source material;

b. to purchase, condemn, or otherwise acquire any interest in real property containing deposits of source material; and

c. to purchase, condemn, or otherwise acquire rights to enter upon any real property deemed by the Commission to have possibilities of containing deposits of source material in order to conduct prospecting and exploratory operations for such deposits.

Any purchase made under this section may be made without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon certification by the Commission that such action is necessary in the interest of the common defense and security, or upon a showing by the Commission that advertising is not reasonably practicable. Partial and advanced payments may be made under contracts for such purposes. The Commission may establish guaranteed prices for all source material delivered to it within a specified time. Just com-

pensation shall be made for any right, property, or interest in property taken, requisitioned, condemned, or otherwise acquired under this section.

* * * * *

SEC. 81. DOMESTIC DISTRIBUTION.—No person may transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, own, possess, import, or export any byproduct material, except to the extent authorized by this section or by section 82. The Commission is authorized to issue general or specific licenses to applicants seeking to use byproduct material for research or development purposes, for medical therapy, industrial uses, agricultural uses, or such other useful applications as may be developed. The Commission may distribute, sell, loan, or lease such byproduct material as it owns to licensees with or without charge: *Provided, however,* That for byproduct material to be distributed by the Commission for a charge, the Commission shall establish prices on such equitable basis as, in the opinion of the Commission, (a) will provide reasonable compensation to the Government for such material, (b) will not discourage the use of such material or the development of sources of supply of such material independent of the Commission, and (c) will encourage research and development. In distributing such material, the Commission shall give preference to applicants proposing to use such material either in the conduct of research and development or in medical therapy. Licensees of the Commission may distribute byproduct material only to applicants therefor who are licensed by the Commission to receive such byproduct material. The Commission shall not permit the distribution of any byproduct material to any licensee, and shall recall or order the recall of any distributed material from any licensee, who is not equipped to observe or who fails

to observe such safety standards to protect health as may be established by the Commission or who uses such material in violation of law or regulation of the Commission or in a manner other than as disclosed in the application therefor or approved by the Commission. The Commission is authorized to establish classes of byproduct material and to exempt certain classes or quantities of material or kinds of uses or users from the requirements for a license set forth in this section when it makes a finding that the exemption of such classes or quantities of such material or such kinds of uses or users will not constitute an unreasonable risk to the common defense and security and to the health and safety of the public.

* * * * *

SEC. 101. LICENSE REQUIRED.—It shall be unlawful, except as provided in section 91, for any person within the United States to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export any utilization or production facility except under and in accordance with a license issued by the Commission pursuant to section 103 or 104.

SEC. 102. FINDING OF PRACTICAL VALUE.—Whenever the Commission has made a finding in writing that any type of utilization or production facility has been sufficiently developed to be of practical value for industrial or commercial purposes, the Commission may thereafter issue licenses for such type of facility pursuant to section 103.

SEC. 103. COMMERCIAL LICENSES.—

a. Subsequent to a finding by the Commission as required in section 102, the Commission may issue licenses to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export under the terms of an agreement for coopera-

tion arranged pursuant to section 123, such type of utilization or production facility. Such licenses shall be issued in accordance with the provisions of chapter 16 and subject to such conditions as the Commission may by rule or regulation establish to effectuate the purposes and provisions of this Act.

b. The Commission shall issue such licenses on a nonexclusive basis to persons applying therefor (1) whose proposed activities will serve a useful purpose proportionate to the quantities of special nuclear material or source material to be utilized; (2) who are equipped to observe and who agree to observe such safety standards to protect health and to minimize danger to life or property as the Commission may by rule establish; and (3) who agree to make available to the Commission such technical information and data concerning activities under such licenses as the Commission may determine necessary to promote the common defense and security and to protect the health and safety of the public. All such information may be used by the Commission only for the purposes of the common defense and security and to protect the health and safety of the public.

c. Each such license shall be issued for a specified period, as determined by the Commission, depending on the type of activity to be licensed, but not exceeding forty years, and may be renewed upon the expiration of such period.

d. No license under this section may be given to any person for activities which are not under or within the jurisdiction of the United States, except for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123, or except under the provisions of section 109. No license may be issued to an alien or any corporation or other entity if the Commission

knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government. In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such person would be inimical to the common defense and security or to the health and safety of the public.

SEC. 104. MEDICAL THERAPY AND RESEARCH AND DEVELOPMENT.—

a. The Commission is authorized to issue licenses to persons applying therefor for utilization facilities for use in medical therapy. In issuing such licenses the Commission is directed to permit the widest amount of effective medical therapy possible with the amount of special nuclear material available for such purposes and to impose the minimum amount of regulation consistent with its obligations under this Act to promote the common defense and security and to protect the health and safety of the public.

b. The Commission is authorized to issue licenses to persons applying therefor for utilization and production facilities involved in the conduct of research and development activities leading to the demonstration of the practical value of such facilities for industrial or commercial purposes. In issuing licenses under this subsection, the Commission shall impose the minimum amount of such regulations and terms of license as will permit the Commission to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the public and will be compatible with the regulations and terms of license which would apply in the event that a commercial license were later to be issued pursuant to section 103 for that type of facility. In issuing such licenses, priority shall be given to those activities which will, in the opinion of

the Commission, lead to major advances in the application of atomic energy for industrial or commercial purposes.

c. The Commission is authorized to issue licenses to persons applying therefor for utilization and production facilities useful in the conduct of research and development activities of the types specified in section 31 and which are not facilities of the type specified in subsection 104 b. The Commission is directed to impose only such minimum amount of regulation of the licensee as the Commission finds will permit the Commission to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the public and will permit the conduct of widespread and diverse research and development.

d. No license under this section may be given to any person for activities which are not under or within the jurisdiction of the United States, except for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123 or except under the provisions of section 109. No license may be issued to any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government. In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such person would be inimical to the common defense and security or to the health and safety of the public.

SEC. 105. ANTITRUST PROVISIONS.—

a. Nothing contained in this Act, including the provisions which vest title to all special nuclear material in the United States, shall relieve any person from the operation of the following Acts, as amended: "An Act to protect trade and commerce against unlawful restraints

and monopolies" approved July second, eighteen hundred and ninety; sections seventy-three to seventy-seven, inclusive, of an Act entitled "An Act to reduce taxation, to provide revenue for the Government, and for other purposes" approved August twenty-seven, eighteen hundred and ninety-four; "An Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes" approved October fifteen, nineteen hundred and fourteen; and "An Act to create a Federal Trade Commission, to define its powers and duties, and for other purposes" approved September twenty-six, nineteen hundred and fourteen. In the event a licensee is found by a court of competent jurisdiction, either in an original action, in that court or in a proceeding to enforce or review the findings or orders of any Government agency having jurisdiction under the laws cited above, to have violated any of the provisions of such laws in the conduct of the licensed activity, the Commission may suspend, revoke, or take such other action as it may deem necessary with respect to any license issued by the Commission under the provisions of this Act.

b. The Commission shall report promptly to the Attorney General any information it may have with respect to any utilization of special nuclear material or atomic energy which appears to violate or to tend toward the violation of any of the foregoing Acts, or to restrict free competition in private enterprise.

c. Whenever the Commission proposes to issue any license to any person under section 103, it shall notify the Attorney General of the proposed license and the proposed terms and conditions thereof, except such classes or types of licenses, as the Commission, with the approval of the Attorney General, may determine would not significantly affect the licensee's activities

under the antitrust laws as specified in subsection 105 a. Within a reasonable time, in no event to exceed 90 days after receiving such notification, the Attorney General shall advise the Commission whether, insofar as he can determine, the proposed license would tend to create or maintain a situation inconsistent with the antitrust laws, and such advice shall be published in the Federal Register. Upon the request of the Attorney General, the Commission shall furnish or cause to be furnished such information as the Attorney General determines to be appropriate or necessary to enable him to give the advice called for by this section.

SEC. 106. CLASSES OF FACILITIES.—The Commission may—

a. group the facilities licensed either under section 103 or under section 104 into classes which may include either production or utilization facilities or both, upon the basis of the similarity of operating and technical characteristics of the facilities;

b. define the various activities to be carried on at each such class of facility; and

c. designate the amounts of special nuclear material available for use by each such facility.

SEC. 107. OPERATORS' LICENSES.—The Commission shall—

a. prescribe uniform conditions for licensing individuals as operators of any of the various classes of production and utilization facilities licensed in this Act;

b. determine the qualifications of such individuals;

c. issue licenses to such individuals in such form as the Commission may prescribe; and

d. suspend such licenses for violations of any provision of this Act or any rule or regulation issued thereunder whenever the Commission deems such action desirable.

SEC. 108. WAR OR NATIONAL EMERGENCY.—Whenever the Congress declares that a state of

war or national emergency exists, the Commission is authorized to suspend any licenses granted under this Act if in its judgment such action is necessary to the common defense and security. The Commission is authorized during such period, if the Commission finds it necessary to the common defense and security, to order the recapture of any special nuclear material or to order the operation of any facility licensed under section 103 or 104, and is authorized to order the entry into any plant or facility in order to recapture such material, or to operate such facility. Just compensation shall be paid for any damages caused by the recapture of any special nuclear material or by the operation of any such facility.

SEC. 109. COMPONENT PARTS OF FACILITIES.—With respect to those utilization and production facilities which are so determined by the Commission pursuant to subsection 11 p. (2) or 11 v. (2) the Commission may (a) issue general licenses for activities required to be licensed under section 101, if the Commission determines in writing that such general licensing will not constitute an unreasonable risk to the common defense and security, and (b) issue licenses for the export of such facilities, if the Commission determines in writing that each export will not constitute an unreasonable risk to the common defense and security.

SEC. 110. EXCLUSIONS.—Nothing in this chapter shall be deemed—

a. to require a license for (1) the processing, fabricating, or refining of special nuclear material, or the separation of special nuclear material, or the separation of special nuclear material from other substances, under contract with and for the account of the Commission; or (2) the construction or operation of facilities under contract with and for the account of the Commission; or

b. to require a license for the manufacture, production, or acquisition by the Department of Defense of any utilization facility authorized pursuant to section 91, or for the use of such facility by the Department of Defense or a contractor thereof.

SEC. 161. GENERAL PROVISIONS.—In the performance of its functions the Commission is authorized to—

b. establish by rule, regulation, or order, such standards and instructions to govern the possession and use of special nuclear material, source material, and byproduct material as the Commission may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property;

i. prescribe such regulations or orders as it may deem necessary (1) to protect Restricted Data received by any person in connection with any activity authorized pursuant to this Act, (2) to guard against the loss or diversion of any special nuclear material acquired by any person pursuant to section 53 or produced by any person in connection with any activity authorized pursuant to this Act, and to prevent any use or disposition thereof which the Commission may determine to be inimical to the common defense and security, and (3) to govern any activity authorized pursuant to this Act, including standards and restrictions governing the design, location, and operation of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property;

p. make, promulgate, issue, rescind, and amend such rules and regulations as may be necessary to carry out the purposes of this Act.

* * * * *

SEC. 170. INDEMNIFICATION AND LIMITATION OF LIABILITY.—

a. Each license issued under section 103 or 104 and each construction permit issued under section 185 shall, and each license issued under section 53, 63, or 81 may, have as a condition of the license a requirement that the licensee have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with subsection 170 b. to cover public liability claims. Whenever such financial protection is required, it shall be a further condition of the license that the licensee execute and maintain an indemnification agreement in accordance with subsection 170 c. The Commission may require, as a further condition of issuing a license, that an applicant waive any immunity from public liability conferred by Federal or State law.

b. The amount of financial protection required shall be the amount of liability insurance available from private sources, except that the Commission may establish a lesser amount on the basis of criteria set forth in writing, which it may revise from time to time, taking into consideration such factors as the following: (1) the cost and terms of private insurance, (2) the type, size, and location of the licensed activity and other factors pertaining to the hazard, and (3) the nature and purpose of the licensed activity: *Provided*, That for facilities designed for producing substantial amounts of electricity and having a rated capacity of 100,000 electrical kilowatts or more, the amount of financial protection required shall be the maximum amount available from private sources. Such financial protection may include private insurance, private contractual indemnities, self insurance, other proof of financial responsibility, or a combination of such measures.

c. The Commission shall, with respect to licenses issued between August 30, 1954, and August 1, 1967, for which it requires financial protection, agree to indemnify and hold harmless the licensee and other persons indemnified, as their interest may appear, from public liability arising from nuclear incidents which is in excess of the level of financial protection required of the licensee. The aggregate indemnity for all persons indemnified in connection with each nuclear incident shall not exceed \$500,000,000 including the reasonable costs of investigating and settling claims and defending suits for damage. Such a contract of indemnification shall cover public liability arising out of or in connection with the licensed activity.

d. In addition to any other authority the Commission may have, the Commission is authorized until August 1, 1967, to enter into agreements of indemnification with its contractors for the construction or operation of production or utilization facilities or other activities under contracts for the benefit of the United States involving activities under the risk of public liability for a substantial nuclear incident. In such agreements of indemnification the Commission may require its contractor to provide and maintain financial protection of such a type and in such amounts as the Commission shall determine to be appropriate to cover public liability arising out of or in connection with the contractual activity, and shall indemnify the persons indemnified against such claims above the amount of the financial protection required, in the amount of \$500,000,000 including the reasonable costs of investigating and settling claims and defending suits for damage in the aggregate for all persons indemnified in connection with such contract and for each nuclear incident. The provisions of this subsection may be applicable to lump sum

as well as cost type contracts and to contracts and projects financed in whole or in part by the Commission.

e. The aggregate liability for a single nuclear incident of persons indemnified, including the reasonable costs of investigating and settling claims and defending suits for damage, shall not exceed the sum of \$500,000,000 together with the amount of financial protection required of the licensee or contractor. The Commission or any person indemnified may apply to the appropriate district court of the United States having venue in bankruptcy matters over the location of the nuclear incident, except that in the case of nuclear incidents caused by ships of the United States outside of the United States, the Commission or any person indemnified may apply to the appropriate district court of the United States having venue in bankruptcy matters over the location of the principal place of business of the shipping company owning or operating the ship, and upon a showing that the public liability from a single nuclear incident will probably exceed the limit of liability imposed by this section, shall be entitled to such orders as may be appropriate for enforcement of the provisions of this section, including an order limiting the liability of the persons indemnified, orders staying the payment of claims and the execution of court judgments, orders apportioning the payments to be made to claimants, orders permitting partial payments to be made before final determination of the total claims, and an order setting aside a part of the funds available for possible latent injuries not discovered until a later time.

f. The Commission is authorized to collect a fee from all persons with whom an indemnification agreement is executed under this section. This fee shall be \$30 per year per thousand kilowatts of thermal energy capacity for facil-

ities licensed under section 103. For facilities licensed under section 104, and for construction permits under section 185, the Commission is authorized to reduce the fee set forth above. The Commission shall establish criteria in writing for determination of the fee for facilities licensed under section 104 taking into consideration such factors as (1) the type, size, and location of facility involved, and other factors pertaining to the hazard, and (2) the nature and purpose of the facility. For other licenses, the Commission shall collect such nominal fees as it deems appropriate. No fee under this subsection shall be less than \$100 per year.

g. In administering the provisions of this section, the Commission shall use, to the maximum extent practicable, the facilities and services of private insurance organizations, and the Commission may contract to pay a reasonable compensation for such services. Any contract made under the provisions of this subsection may be made without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon a showing by the Commission that advertising is not reasonably practicable and advance payments may be made.

h. The agreement of indemnification may contain such terms as the Commission deems appropriate to carry out the purposes of this section. Such agreement shall provide that, when the Commission makes a determination that the United States will probably be required to make indemnity payments under this section, the Commission shall collaborate with any person indemnified and may approve the payment of any claim under the agreement of indemnification, appear through the Attorney General on behalf of the person indemnified, take charge of such action, and settle or defend any such action. The Commission shall have

final authority on behalf of the United States to settle or approve the settlement of any such claim on a fair and reasonable basis with due regard for the purposes of this Act. Such settlement may include reasonable expenses in connection with the claim incurred by the person indemnified.

i. After any nuclear incident which will probably require payments by the United States under this section, the Commission shall make a survey of the causes and extent of damage which shall forthwith be reported to the Joint Committee, and, except as forbidden by the provisions of chapter 12 of this Act or any other law or Executive order, all final findings shall be made available to the public, to the parties involved and to the courts. The Commission shall report to the Joint Committee by April 1, 1958, and every year thereafter on the operations under this section.

j. In administering the provisions of this section, the Commission may make contracts in advance of appropriations and incur obligations without regard to section 3679 of the Revised Statutes, as amended.

k. With respect to any license issued pursuant to sections 53, 63, 81, 104 a., or 104 c. for the conduct of educational activities to a person found by the Commission to be a nonprofit educational institution, the Commission shall exempt such licensee from the financial protection requirement of subsection 170 a. With respect to licenses issued between August 30, 1954, and August 1, 1967, for which the Commission grants such exemption:

(1) the Commission shall agree to indemnify and hold harmless the licensee and other persons indemnified, as their interests may appear, from public liability in excess of \$250,000 arising from nuclear incident. The aggregate indemnity for all persons indemnified in connec-

tion with each nuclear incident shall not exceed \$500,000,000, including the reasonable cost of investigating and settling claims and defending suits for damage;

(2) such contracts of indemnification shall cover public liability arising out of or in connection with the licensed activity; and shall include damage to property of persons indemnified, except property which is located at the site of and used in connection with the activity where the nuclear incident occurs; and

(3) such contracts of indemnification, when entered into with a licensee having immunity from public liability because it is a State agency, shall provide also that the Commission shall make payments under the contract on account of activities of the licensee in the same manner and to the same extent as the Commission would be required to do if the licensee were not such a State agency.

Any licensee may waive an exemption to which it is entitled under this subsection.

1. The Commission is authorized until August 1, 1967, to enter into an agreement of indemnification with any person engaged in the design, development, construction, operation, repair, and maintenance or use of the nuclear-powered ship authorized by section 716 of the Merchant Marine Act, 1936, and designated the "nuclear ship Savannah". In any such agreement of indemnification the Commission may require such person to provide and maintain financial protection of such a type and in such amounts as the Commission shall determine to be appropriate to cover public liability arising from a nuclear incident in connection with such design, development, construction, operation, repair, maintenance or use and shall indemnify the person indemnified against such claims above the amount of the financial protection required, in the maximum amount provided by

subsection e. including the reasonable costs of investigating and settling claims and defending suits for damage.

* * * * *

SEC. 181. GENERAL.—The provisions of the Administrative Procedure Act (Public Law 404, Seventy-ninth Congress, approved June 11, 1946) shall apply to all agency action taken under this Act, and the terms “agency” and “agency action” shall have the meaning specified in the Administrative Procedure Act: *Provided, however,* That in the case of agency proceedings or actions which involve Restricted Data or defense information, the Commission shall provide by regulation for such parallel procedures as will effectively safeguard and prevent disclosure of Restricted Data or defense information to unauthorized persons with minimum impairment of the procedural rights which would be available if Restricted Data or defense information were not involved.

SEC. 182. LICENSE APPLICATIONS.—

a. Each application for a license hereunder shall be in writing and shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant, the character of the applicant, the citizenship of the applicant, or any other qualifications of the applicant as the Commission may deem appropriate for the license. In connection with applications for licenses to operate production or utilization facilities, the applicant shall state such technical specifications, including information of the amount; kind, and source of special nuclear material required, the place of the use, the specific characteristics of the facility, and such other information as the Commission may, by rule or regulation, deem necessary in order to enable it to find that the utilization or production of special nuclear material will be in ac-

cord with the common defense and security and will provide adequate protection to the health and safety of the public. Such technical specifications shall be a part of any license issued. The Commission may at any time after the filing of the original application, and before the expiration of the license, require further written statements in order to enable the Commission to determine whether the application should be granted or denied or whether a license should be modified or revoked. All applications and statements shall be signed by the applicant or licensee. Applications for, and statements made in connection with, licenses under sections 103 and 104 shall be made under oath or affirmation. The Commission may require any other applications or statements to be made under oath or affirmation.

b. The Advisory Committee on Reactor Safeguards shall review each application under section 103 or 104 b for a license for a facility, any application under section 104 c. for a testing facility, and any application under section 104 a. or c. specifically referred to it by the Commission, and shall submit a report thereon, which shall be made part of the record of the application and available to the public, except to the extent that security classification prevents disclosure.

c. The Commission shall not issue any license for a utilization or production facility for the generation of commercial power under section 103, until it has given notice in writing to such regulatory agency as may have jurisdiction over the rates and services of the proposed activity, to municipalities, private utilities, public bodies, and cooperatives within transmission distance authorized to engage in the distribution of electric energy and until it has published notice of such application once each week for four consecutive weeks in the Federal Register, and until four weeks after the last notice.

d. The Commission, in issuing any license for a utilization or production facility for the generation of commercial power under section 103, shall give preferred consideration to applications for such facilities which will be located in high cost power areas in the United States if there are conflicting applications for a limited opportunity for such license. Where such conflicting applications resulting from limited opportunity for such license include those submitted by public or cooperative bodies such applications shall be given preferred consideration.

SEC. 183. TERMS OF LICENSES.—Each license shall be in such form and contain such terms and conditions as the Commission may, by rule or regulation, prescribe to effectuate the provisions of this Act, including the following provisions:

a. Title to all special nuclear material utilized or produced by facilities pursuant to the license, shall at all times be in the United States.

b. No right to the special nuclear material shall be conferred by the license except as defined by the license.

c. Neither the license nor any right under the license shall be assigned or otherwise transferred in violation of the provisions of this Act.

d. Every license issued under this Act shall be subject to the right of recapture or control reserved by section 108, and to all of the other provisions of this Act, now or hereafter in effect and to all valid rules and regulations of the Commission.

SEC. 184. ~~INALIENABILITY OF LICENSE~~.—No license granted hereunder and no right to utilize or produce special nuclear material granted hereby shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through

transfer of control of any license to any person, unless the Commission shall, after securing full information, find that the transfer is in accordance with the provisions of this Act, and shall give its consent in writing. The Commission may give such consent to the creation of a mortgage, pledge, or other lien upon any facility owned or thereafter acquired by a licensee, or upon any leasehold or other interest in such property, and the rights of the creditors so secured may thereafter be enforced by any court subject to rules and regulations established by the Commission to protect public health and safety and promote the common defense and security.

SEC. 185. CONSTRUCTION PERMITS.—All applicants for licenses to construct or modify production or utilization facilities shall, if the application is otherwise acceptable to the Commission, be initially granted a construction permit. The construction permit shall state the earliest and latest dates for the completion of the construction or modification. Unless the construction or modification of the facility is completed by the completion date, the construction permit shall expire, and all rights thereunder be forfeited, unless upon good cause shown, the Commission extends the completion date. Upon the completion of the construction or modification of the facility, upon the filing of any additional information needed to bring the original application up to date, and upon finding that the facility authorized has been constructed and will operate in conformity with the application as amended and in conformity with the provisions of this Act and of the rules and regulations of the Commission, and in the absence of any good cause being shown to the Commission why the granting of a license would not be in accordance with the provisions of this Act, the Commission shall

thereupon issue a license to the applicant. For all other purposes of this Act, a construction permit is deemed to be a "license".

SEC. 186. REVOCATION.—

a. Any license may be revoked for any material false statement in the application or any statement of fact required under section 182, or because of conditions revealed by such application or statement of fact or any report, record, or inspection or other means which would warrant the Commission to refuse to grant a license on an original application, or for failure to construct or operate a facility in accordance with the terms of the construction permit or license or the technical specifications in the application, or for violation of, or failure to observe any of the terms and provisions of this Act or of any regulation of the Commission.

b. The Commission shall follow the provisions of section 9(b) of the Administrative Procedure Act in revoking any license.

c. Upon revocation of the license, the Commission may immediately retake possession of all special nuclear material held by the licensee. In cases found by the Commission to be of extreme importance to the national defense and security or to the health and safety of the public, the Commission may recapture any special nuclear material held by the licensee or may enter upon and operate the facility prior to any of the procedures provided under the Administrative Procedure Act. Just compensation shall be paid for the use of the facility.

SEC. 187. MODIFICATION OF LICENSE.—The terms and conditions of all licenses shall be subject to amendment, revision, or modification, by reason of amendments of this Act or by reason of rules and regulations issued in accordance with the terms of this Act.

SEC. 188. CONTINUED OPERATION OF FACILITIES.—Whenever the Commission finds that the public convenience and necessity or the

production program of the Commission requires continued operation of a production facility or utilization facility the license for which has been revoked pursuant to section 186, the Commission may, after consultation with the appropriate regulatory agency, State or Federal, having jurisdiction, order that possession be taken of and such facility be operated for such period of time as the public convenience and necessity or the production program of the Commission may, in the judgment of the Commission, require, or until a license for the operation of the facility shall become effective. Just compensation shall be paid for the use of the facility.

SEC. 189. HEARINGS AND JUDICIAL REVIEW.—

a. In any proceeding under this Act, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award or royalties under sections 153, 157, 186 c., or 188, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register on each application under section 103 or 104 b. for a license for a facility, and on any application under section 104 c. for a license for a testing facility.

(b) Any final order entered in any proceeding of the kind specified in subsection a. above shall be subject to judicial review in the manner prescribed in the Act of December 29, 1950, as amended (ch. 1189, 64 Stat. 1129), and to the provisions of section 10 of the Administrative Procedure Act, as amended.

SEC. 201. MEMBERSHIP.—There is hereby established a Joint Committee on Atomic Energy to be composed of nine Members of the Senate to be appointed by the President of the Senate, and nine Members of the House of Representatives to be appointed by the Speaker of the House of Representatives. In each instance not more than five Members shall be members of the same political party.

SEC. 202. AUTHORITY AND DUTY.—The Joint Committee shall make continuing studies of the activities of the Atomic Energy Commission and of problems relating to the development, use, and control of atomic energy. During the first sixty days of each session of the Congress, the Joint Committee shall conduct hearings in either open or executive session for the purpose of receiving information concerning the development, growth, and state of the atomic energy industry. The Commission shall keep the Joint Committee fully and currently informed with respect to all of the Commission's activities. The Department of Defense shall keep the Joint Committee fully and currently informed with respect to all matters within the Department of Defense relating to the development, utilization, or application of atomic energy. Any Government agency shall furnish any information requested by the Joint Committee with respect to the activities or responsibilities of that agency in the field of atomic energy. All bills, resolutions, and other matters in the Senate or the House of Representatives relating primarily to the Commission or to the development, use, or control of atomic energy shall be referred to the Joint Committee. The members of the Joint Committee who are Members of the Senate shall from time to time report to the Senate, and the members of the Joint Committee who are Members of the House of Representatives shall from time to time re-

port to the House, by bill or otherwise, their recommendations with respect to matters within the jurisdiction of their respective Houses which are referred to the Joint Committee or otherwise within the jurisdiction of the Joint Committee.

SEC. 203. CHAIRMAN.—Vacancies in the membership of the Joint Committee shall not affect the power of the remaining members to execute the functions of the Joint Committee, and shall be filled in the same manner as in the case of the original selection. The Joint Committee shall select a Chairman and a Vice Chairman from among its members, at the beginning of each Congress. The Vice Chairman shall act in the place and stead of the Chairman, in the absence of the Chairman. The Chairmanship shall alternate between the Senate and the House of Representatives with each Congress, and the Chairman shall be selected by the Members from that House entitled to the Chairmanship. The Vice Chairman shall be chosen from the House other than that of the Chairman by the Members from that House.

SEC. 204. POWERS.—In carrying out its duties under this Act, the Joint Committee, or any duly authorized subcommittee thereof, is authorized to hold such hearings or investigations, to sit and act at such places and times, to require, by subpoena or otherwise, the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths, to take such testimony, to procure such printing and binding, and to make such expenditures as it deems advisable. The Joint Committee may make such rules respecting its organization and procedures as it deems necessary: *Provided, however,* That no measure or recommendation shall be reported from the Joint Committee unless a majority of

the committee assent. Subpenas may be issued over the signature of the Chairman of the Joint Committee or by any member designated by him or by the Joint Committee, and may be served by such person or persons as may be designated by such Chairman or member. The Chairman of the Joint Committee or any member thereof may administer oaths to witnesses. The Joint Committee may use a committee seal. The provisions of sections 102 to 104, inclusive, of the Revised Statutes, as amended, shall apply in case of any failure of any witness to comply with a subpoena or to testify when summoned under authority of this section. The expenses of the Joint Committee shall be paid from the contingent fund of the Senate from funds appropriated for the Joint Committee upon vouchers approved by the Chairman. The cost of stenographic service to report public hearings shall not be in excess of the amounts prescribed by law for reporting the hearings of standing committees of the Senate. The cost of stenographic service to report executive hearings shall be fixed at an equitable rate by the Joint Committee. Members of the Joint Committee, and its employees and consultants, while traveling on official business for the Joint Committee, may receive either the per diem allowance authorized to be paid to Members of Congress or its employees, or their actual and necessary expenses provided an itemized statement of such expenses is attached to the voucher.

SEC. 205. STAFF AND ASSISTANCE.—The Joint Committee is empowered to appoint and fix the compensation of such experts, consultants, technicians, and staff employees as it deems necessary and advisable. The Joint Committee is authorized to utilize the services, information, facilities, and personnel of the departments and establishments of the Govern-

ment. The Joint Committee is authorized to permit such of its members, employees, and consultants as it deems necessary in the interest of common defense and security to carry firearms while in the discharge of their official duties for the committee.

SEC. 206. CLASSIFICATION OF INFORMATION.—The Joint Committee may classify information originating within the committee in accordance with standards used generally by the executive branch for classifying Restricted Data or defense information.

SEC. 207. RECORDS.—The Joint Committee shall keep a complete record of all committee actions, including a record of the votes on any question on which a record vote is demanded. All committee records, data, charts, and files shall be the property of the Joint Committee and shall be kept in the offices of the Joint Committee or other places as the Joint Committee may direct under such security safeguards as the Joint Committee shall determine in the interest of the common defense and security.

2. The regulations of the Atomic Energy Commission, 10 CFR, provide in pertinent part:

SECTION 2.102 Action on applications, hearings. (a) The AEC will, upon request of the applicant or an intervener, and may upon its own initiative, direct the holding of a formal hearing prior to taking action on the application. If no prior formal hearing has been held and no notice of proposed action has been served as provided in paragraph (b) of this section, AEC will direct the holding of a formal hearing upon receipt of a request therefor from the applicant or an intervener within 30 days after the issuance of a license or other approval or a notice of denial.

(b) In such cases as it deems appropriate, AEC may cause to be served upon the applicant, and published, a notice of proposed action upon his application and shall cause copies thereof to be served upon interveners or others entitled to or requesting notification. The notice shall state the terms of the proposed action. If a formal hearing has not been held prior to issuance of the notice, AEC will direct the holding of a formal hearing upon the request of the applicant or an intervener received within fifteen days following the service of the notice.

* * * * *

SECTION 50.34 *Contents of applications; technical information; hazards summary report.* Each application shall state the following technical information:

(a) A description of the chemical, physical, metallurgical, or nuclear process to be performed, and a statement of the kind and quantity of any radioactive effluent expected to result from the process. The description of the process should be sufficiently detailed to permit evaluation of the radioactive hazards involved. The magnitude of the proposed operation should be indicated in terms of the amount and radioactivity of source, special nuclear, or by-product material to be handled per unit of time, and thermal power to be generated if any.

(b) A description of the facility. The description should be based on the design criteria for the facility as a whole and for those major component parts which are essential to the safe operation of the facility, and should be presented in sufficient detail to allow an evaluation of the adequacy of the various means proposed to minimize the probability of danger from radioactivity to persons both on and off-site. The description should also cover any activities, other than those subject to license, proposed to be carried on in the building which will house the facility and on the balance of the site.

(c) A description of the site on which the facility is to be located. This should include a map of the area showing the location of the site and indicating the use to which the surrounding land is put, i.e., industrial, commercial, agricultural, residential; location of sources of potable or industrial water supply, watershed areas and public utilities; and a scale plot plan of the site showing the proposed location of the facility.

(d) A description of proposed procedures for: routine and non-routine operations, start-up and shut-down, maintenance, storage, training of employees, minimizing operational mishaps (such as locked controls, checklists, and close supervision), investigating unusual or unexpected incidents; and a description of such other details as may be useful in evaluating the existence and effectiveness of safeguards against the radioactive hazards in the operation of the facility.

(e) A description of plans or proposals in the event that acts or accidents occur which would create radioactive hazards. The description should relate the various operational procedures, the protective devices, and the pertinent features of the site, to such happenings as operational mistakes, equipment or instrument failure or malfunction, fire, electric power failure, flood, earthquake, storm, strike, and riot.

(f) Meteorological, hydrological, geological, and seismological data necessary for evaluating the measures proposed for protecting the public against possible radioactive hazards.

(g) An evaluation of the proposed measures and devices to prevent acts or accidents which would create radioactive hazards or to protect against the consequences should such acts or accidents occur.

(h) A description of procedures for disposal of radioactive solid waste and the final disposal of liquid waste effluent.

(i) A description of means provided to sample atmosphere discharges through stacks where such stacks may emit by-product material or special nuclear material.

SECTION 50.35 *Extended time for providing technical information.* Where, because of the nature of a proposed project, an applicant is not in a position to supply initially all of the technical information otherwise required to complete the application, he shall indicate the reason, the items or kinds of information omitted, and the approximate times when such data will be produced. If the Commission is satisfied that it has information sufficient to provide reasonable assurance that a facility of the general type proposed can be constructed and operated at the proposed location without undue risk to the health and safety of the public and that the omitted information will be supplied, it may process the application and issue a construction permit on a provisional basis without the omitted information subject to its later production and an evaluation by the Commission that the final design provides reasonable assurance that the health and safety of the public will not be endangered.

* * * * *

SECTION 50.40 *Common standards.* In determining that a license will be issued to an applicant the Commission will be guided by the following considerations:

(a) The processes to be performed, the operating procedures, the facility and equipment, the use of the facility, and other technical specifications; or the proposals in regard to any of the foregoing collectively provide reasonable assurance that the applicant will com-

ply with the regulations in this chapter, including the regulations in Part 20, and that the health and safety of the public will not be endangered.

(b) The applicant is technically and financially qualified to engage in the proposed activities in accordance with the regulations in this chapter.

(c) The issuance of a license to the applicant will not, in the opinion of the Commission, be inimical to the common defense and security or to the health and safety of the public.

* / * * *

APPENDIX B

RELATION TO POPULATION CENTERS OF POWER REACTORS IN OPERATION OR UNDER CONSTRUCTION¹

A. LICENSED REACTORS

1. Commonwealth Edison Co., Morris, Ill., operating license issued, 626,000 thermal kilowatts: 14 miles from Joliet, 47 miles southwest of downtown Chicago; population within 5 miles—2,600, within 25 miles—192,000.

2. General Electric Co., Vallecitos, Calif., operating license issued, 30,000 thermal kilowatts: 33 miles east-southeast of San Francisco; population within 10 miles—22,000, within 25 miles—250,000.

3. Yankee Atomic Electric Co., Rowe, Mass., operating license issued, 392,000 thermal kilowatts: within 20 miles of Bennington, Vt., and Adams, Greenfield and

¹ Population figures are taken from applications filed with the Commission to initiate licensing proceedings (for licensed facilities), or technical reports used in authorization proceedings (for Commission-owned reactors to be operated by local public bodies), constituting public documents of the Commission. The Shippingport data is taken from a Commission publication in 1957, WAPD-SC-547 describing the plant and surrounding area.

The reactors' capacities in thermal kilowatts are given as estimated on the best available information in the Commission's February 1960 report to the Joint Committee on Atomic Energy, in connection with the annual hearings on the atomic energy industry under Section 202 of the Act. Hearings on the Development, Growth and State of the Atomic Energy Industry Before the Joint Committee on Atomic Energy, 86th Cong., 2d Sess., p. 579.

North Adams, Mass., 40 miles east of Albany; population within 5 miles—2,036, within 20 miles—104,293.

4. Carolinas-Virginia Nuclear Power Associates, Inc., Parr, S.C., construction permit issued, 60,500 thermal kilowatts: 25 miles northwest of Columbia, S.C.; population within 5 miles—15 per square mile, within 10 miles—25 per square mile.

5. Consolidated Edison Co., Indian Point, N.Y., construction permit issued, 795,000 thermal kilowatts: 24 miles north of New York City; population within 5 miles—45,000.

6. Consumers Power Co., Big Point Rock, Mich., construction permit issued, 240,000 thermal kilowatts: 85 miles southwest of Sault Ste. Marie, 165 miles north of Grand Rapids; population within 5 miles—4,964, within 20 miles—26,700, within 40 miles—52,000.

7. Northern States Power Co., Sioux Falls, South Dakota, construction permit issued, 203,000 thermal kilowatts: 5.5 miles from center of Sioux Falls; population within 5 miles—10,000, within 10 miles—60,000, within 40 miles—175,000.

8. Power Reactor Development Co., Lagoon Beach, Michigan, construction permit issued, 304,000 thermal kilowatts: 30 miles from Detroit; population within 5 miles—1,800, within 20 miles—187,000, within 30 miles—2,001,700.

9. Saxton Nuclear Experiment Corp., Saxton, Pennsylvania, construction permit issued, 20,000 thermal kilowatts: 22 miles south of Altoona, Pa., 90 miles west of Harrisburg, 100 miles east of Pittsburgh; population within 5 miles—5,627, within 10 miles—18,303.

10. Pacific Gas & Electric Co., Humboldt County, California, construction permit issued, 163,000 thermal kilowatts: 4 miles southwest of Eureka; population within 5 miles—40,500, within 25 miles—77,740.

B. GOVERNMENT-OWNED REACTORS

1. Shippingport Atomic Power Station, Shippingport, Pa., in operation, 231,000 thermal kilowatts: 25 miles from Pittsburgh (30 miles from center of Pittsburgh); population within 5 miles—20,000, within 15 miles—225,000, within 40 miles—2,800,000.
2. Consumers Public Power District, Hallam, Nebr., provisional construction authorization, 254,000 thermal kilowatts: 19 miles south of Lincoln, 65 miles southwest of Omaha; population within 5 miles—1,052, within 10 miles—6,678.
3. City of Piqua, Ohio at outskirts of Piqua, provisional construction authorization, 45,500 thermal kilowatts: 28 miles north of Dayton, 70 miles north of Cincinnati; population within 5 miles—21,000, within 25 miles—108,000.
4. Rural Cooperative Power Association, Elk River, Minn., provisional construction authorization, 73,000 thermal kilowatts: 20–35 miles northwest of St. Paul—Minneapolis; population within 5 miles—2,656, within 10 miles—7,700.
5. Puerto Rico Water Resources Authority, Punta Higuera, Puerto Rico, provisional construction authorization, 50,000 thermal kilowatts: 13 miles northwest of Mayaguez; population within 2 miles—1,400, within 15 miles—173,000.